Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public hearing

Audience publique

December 5th, 2012

Le 5 décembre 2012

Hope Fellowship Church
1685 Bloor Street
Courtice, Ontario

Église Hope Fellowship
1685, rue Bloor
Courtice (Ontario)

Commission Members present

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

Commissaires présents

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

Secretary:

Mr. Marc Leblanc

Secrétaire:

M. Marc Leblanc

Senior General Counsel :

Mr. Jacques Lavoie

Avocat général principal:

M. Jacques Lavoie

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Courtice, Ontario

--- Upon commencing on Wednesday, December 5, 2012 at 8:30 a.m./L'audience débute le 5 décembre 2012 à 8h30

Opening Remarks

MR. LEBLANC: Bonjour, mesdames et messieurs. Welcome to the third day of the Darlington Public Hearing. The Canadian Nuclear Safety Commission will resume the hearing on the Darlington Nuclear site.

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.

We would ask that you keep the pace of speech relatively slow so that the translators have a chance of keeping up.

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

Les transcriptions seront disponibles sur le site web de la Commission dans 10 à 14 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 cell phones and other electronic devices.

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

Mr. President.

THE CHAIRMAN: Merci, Marc.

Good morning and welcome to the continuation of the public hearing of the Canadian Nuclear Safety Commission and welcome to all of you joining us through the webcasting or through telecommunication or the teleconference.

I will begin by introducing again the Members of the Commission that are with us today. On my right, Dr. Moyra McDill and Mr. Dan Tolgyesi. On my left is Ms. Rumina Velshi, Dr. Ronald Barriault and Monsieur André Harvey.

We've heard from Marc Leblanc, the Secretary of the Commission, and we also have with us Monsieur Jacques Lavoie, Senior General Counsel to the Commission.

So I would to start by reminding everybody

-- remind you again that we read every document that is presented to us in detail. You saw that the last two days. Our preference is to go into the submission that was said to us. So I would like everybody to assist us and stick to the 10-minute allotment so we can engage in a discussion on the submission you presented.

So with this introduction, let me move to the next submission, which is a presentation by Women in Nuclear Canada, as outlined in CMD 12-H13.81. And I understand that Ms. Cottrill will make this presentation. Please proceed.

12-H13.81
Oral presentation by
Women in Nuclear-Canada

MS. COTTRILL: Thank you.

Good morning, President Binder, Commissioner, Members and members of the public.

My name is Cheryl Cottrill, and I'm the Executive Director for Women in Nuclear Canada, or WIN Canada for short. With me here today is Janet Donegan who is the Director of Supply Services for Darlington and the past Chair of our WIN Durham Chapter.

Our organizational goals are to educate

ourselves so we can better educate the public, to provide professional development to our members and to support women working in the industry, and to promote careers and interest in science with today's youth, especially young women and girls.

We're here representing 1,300 members across Canada, the majority of whom work in power generation and many of whom work at Darlington.

WIN believes that educating our members about all aspects of the industry provides them with the information necessary to help educate our families, our friends and members of the public.

This dialogue provides an opportunity for the public to make an informed decision about whether or not they choose to support our industry.

In an industry where women make up a little less than 20 percent, our organization works not only to provide a collective voice for women in the industry but to help women succeed by supporting programs such as leadership programs for women.

We work to showcase the vital contribution that women are making as leaders in our industry. WIN members devote a great deal of their volunteer time working with young women and girls, introducing them to non-traditional but rewarding career choices in science,

technology and the skilled trades.

One of the programs we run is a girls' science club and camp designed to encourage a lifelong love and curiosity of science, and also encourage girls to develop, maintain or continue their studies in science.

We also volunteer with Skills Canada each year to reach 1,400 young women, aged 12 to 18, and introduce them to the well-paying trade and technology positions in our industry.

All of this work changes the perception of the industry from male-dominated to diverse-friendly and is strengthening the talent pipeline by influencing young girls and women to consider the nuclear industry as a first-choice career option. This ensures the industry is attracting the best and the brightest.

MS. DONEGAN: The industry is very supportive of our programs and events, enhancing the advancement of women and highlighting the important role women play. Our members come form very diverse backgrounds of work experience and education and are involved in every level from maintenance, operations and radiation technicians, to the role of Vice-President.

We work at nuclear generating stations by choice and live in the communities surrounding the station. As we are highly skilled workers, we could work

in any industry, but we choose to work in nuclear because we know we are helping to produce a safe, reliable, low-carbon base load source of 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 and the environment, but to protect the communities in which our family and friends reside.

Safety is the number one priority in everything we do at the station. This strong culture of safety also spills over to our outside activities, at work, at home and in our volunteer community.

MS. COTTRILL: Many of our members have raised children within a close proximity to Darlington.

As moms, we worry about many issues facing the safety and well-being of our children on a daily basis. The fact that we live close to a nuclear generating 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 the technology was safe. The safety of our families, our friends and our communities comes first before our chosen careers. We simply would never put them at risk.

MS. DONEGAN: OPG recently achieved an important safety milestone achieving 13 million hours

worked without a loss time accident at Darlington in 2012. As employees, we know Canada's nuclear power operations have a proven track record of being amongst the safest in the world.

We know nuclear power is the work horse of energy production in Ontario and provides base load electricity which is responsible for providing power to our parents and grandparents in nursing homes. Our family and friends when they require hospital care and our daily use from the coffee in the morning to running the dishwasher after our evening newscast.

Our busy lives rely on safe, reliable supply of electricity and we're thankful to have over 50 per cent of that electricity in Ontario from our nuclear stations.

MS. COTTRILL: As women, we are concerned about the legacy we are leaving for our children and our grandchildren. We know nuclear generated electricity produces virtually no greenhouse gas emissions and therefore 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 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.

Nuclear power plants produce large amounts of continuous power enabling the use of renewables which -- such as wind and solar which are intermittent.

MS. DONEGAN: OPG's commitment to public safety and environmental stewardship includes the safe, secure and responsible management of all nuclear waste products.

As employees of the industry, we know OPG has a successful history of safe and responsible storage of its nuclear waste at all three of its waste management facilities.

Many of our wind members live in close proximity to these managed storage facilities with their families and have no concerns about safety. The Darlington waste management facility has been operating safely within regulatory limits to protect the public, workers and the environment since it began in November 2007.

The employees at the facility have never had a loss time accident since it began operating five years ago. We are confident in the long-term plans being put in place by the OPG's DGR project for low and intermediate long-term waste storage and by the NWMO for

the long-term storage of spent fuel.

We believe given OPG's long history in managing their nuclear waste that they are well equipped to manage the waste originating from refurbishment.

Refurbishment projects provide jobs for a variety of skilled trades such as pipefitters and welders; for highly qualified professionals like engineers and scientists; and important supporting positions like truck drivers and security guards.

We would like to see our community's young people remain in the Durham Region for these -- for this employment. These highly skilled jobs are also good paying jobs which will provide our family and friends with a good standard of living while working in a safe environment.

MS. COTTRILL: 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. Investing in, refurbished or new plants, has also been known -- shown to be an effective way to create many thousands of well-paid jobs at the same time avoiding or reducing the carbon emissions on a large scale.

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 that we know that we will return safely and that our friends and families will be safe in our communities 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 or to OPG's waste management facility.

MS. DONEGAN: I was the first female control technician hired in OPG nuclear 26 years ago and was excited to be able to work at Darlington and learn firsthand all about the robust safety measures as the systems were turned over from construction.

I smile today as I walk through the plant and see the diverse work groups we have knowing that I played an important role in that trailblazing. I'm proud to see the skilled safety conscious workforce of both men and women working side-by-side delivery safe, reliable power at today's plants.

Because of our day-to-day interaction with the nuclear industry and our strong belief in the expertise of OPG's employees and their proven history of safe operation and responsible waste management, WIN Canada supports OPG's three applications before the

Commission.

THE CHAIRMAN: Thank you.

Okay, I'll open up for questions. Monsieur Harvey?

MEMBRE HARVEY: Merci monsieur le président.

You mentioned that you were concerned about the legacy we are leaving for our children but I will direct my question to OPG.

Could you elaborate what is done, what is currently done in order not to let the problem -- well, I would not say the problem -- but the nuclear legacy to other generations? So what is done, currently done to avoid that?

MR. TREMBLAY: Pierre Tremblay, for the record.

I'm going to let Terry Doran speak to the waste minimization and the handling of low and intermediate waste and so on. We've talked a little bit over the last couple of days around the plans to manage the waste and the longer term plans but I'll let Terry elaborate a little bit on that again. Terry.

MR. DORAN: Yeah. Terry Doran, for the record.

As we've mentioned, OPG is taking a very

proactive approach to ensure we don’t pass the burden in the area of waste management on to future generations. We’ve done that by setting aside funds through the Ontario Nuclear Funds Agreement for both the long-term storage and management of waste ultimately leading to the final decision for repository as well as for funds to do decommissioning of all our nuclear waste management facilities.

Both of these initiatives are underway with independent reviews evaluating the safety case to demonstrate that we will achieve these in a safe and efficient manner.

In the interim, all waste is either stored, in the case of used fuel, in our interim storage facilities at the sites, which we’ve talked about today which are very robust. As well as low and intermediate level waste is internally stored at our western waste management facility.

All these facilities are routinely inspected by both the CNSC and other regulators. And our performance to date as demonstrated through independent audits and assessment has shown us to be achieving excellent performance in all these areas.

MEMBER HARVEY: Thank you.

I would just ask the staff how is it

possible to determine a fund that will assure that the waste will be well managed during a hundred of years?

MR. JAMMAL: Ramzi Jammal, for the record.

Before I pass it on to Mr. Elder and my colleagues, we have with us Mr. Dave McCauley, I just saw him. He's from NRCan. But before I pass it on, it's the Government of Canada, has a policy in place with respect to the long-term management of the waste to ensure the funds as being mentioned by OPG.

Second is the CNSC and its existence is to ensure regulatory oversight regardless of the short-term, long-term or the level of the waste. So as long as CNSC exists, there will always be a safe operations. Peter?

MR. ELDER: Peter Elder, for the record.

I just remind everybody that the CNSC does require that there be financial guarantees in place as part of the licensing. And I'll ask Don Howard to give you the details on how we determine the costing of that one for long-term storage.

MR. HOWARD: Don Howard, Director of the Waste and Decommissioning Division.

I guess Mr. Harvey, and to answer your question, there's two components. One is the short-term management of the waste right now. And basically that is currently being done under a licence. Safety programs are

in place for the management of the waste. CNSC staff conduct inspections to ensure that OPG conforms to the requirements of the CNSC and the management of that waste.

As for the long-term management, basically there -- OPG has an initiative on -- a proposal on the table. They've submitted an application for siting of a deep geological repository up in Kincardine.

This program is currently before a panel review and, basically, CNSC staff is currently assessing the information that has been presented.

As far as the financial guarantee is a requirement of the licence -- it's a licence requirement that the proponent submit a -- what we call a decommissioning plan or strategy where they will look forward and look at the costing of the decommissioning of the power plants as well as the costing for the long-term management of the waste material which includes the low and intermediate level waste and includes high level waste.

So basically, that is costed out, is reviewed by CNSC staff and, in OPG's case, this was presented to the Commission in October of this year. We still haven't -- the Commission hasn't provided a decision on that proposal, but the information was presented to the Commission in October. And essentially, the costing that

is provided is also backed by the Province of Ontario.

And also, there's a third party independent review which is conducted by the Ontario financing authority, so basically they have a look to make sure that the funds are appropriate for the long-term management.

So in CNSC staff's view, that basically provides for the funding so that we do not pass it on to future generations, that the current generation is saying “It's our responsibility.” We're providing the funding today so that we don't pass the burden on to future generations.

THE CHAIRMAN: Thank you.

Next question, please. Dr. McDill?

MEMBER McDILL: Thank you.

The intervenors raised some points concerning emissions from the various types of technologies available, and I think yesterday we asked staff if they might have available a new slide on life cycle costs for the various technologies.

Is that available this morning?

MR. JAMMAL: Ramzi Jammal, for the record.

The information is available, so to confirm the fact that the -- with respect to the life cycle, the greenhouse emission as it relates to nuclear has not changed. The President asked the question yesterday, "Has

there been any updates or any change?"

The 2011 publications from the IAEA demonstrate that the nuclear fuel cycle here, the life cycle of the greenhouse gas is the lowest of all of the industry -- energy-producing industry. And this is available on the IAEA website.

I will provide the secretary with a link from that perspective.

THE CHAIRMAN: But that's another study, The Canadian Energy Research Institute, that you may want to add to the list of such studies.

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

The reference I made from the IAEA collectively consolidated multiple studies -- synthesized multiple studies, and I believe -- I have to confirm was the Canadian study included or not. But I will give better precision.

THE CHAIRMAN: Okay, thank you.

Next question? Anybody else?

Just one quick question. Yesterday, we had the Provincial Council of Women of Ontario who -- I'm just trying to understand whether they are members or partners or you're partners with them. I'm trying to understand. They speak for women in nuclear.

MS. COTTRILL: No, we are not partners with them.

THE CHAIRMAN: Have you -- I don't know if you heard their presentation and you have any comment on it.

MS. COTTRILL: No, I'm sorry, I missed that presentation.

THE CHAIRMAN: Okay. Thank you.

Thank you very much.

The next submission is an oral presentation from Ms. Cherry as outlined in CMD 12-H13.83 and 13.82A. Did I get this right; 13.82A.

Ms. Cherry, the floor is yours.

12-H13.83 / 12-H13.82A
Oral presentation by
Deborah Cherry

MS. CHERRY: Thank you very much. Good morning. Bonjour.

My name is Deborah Cherry. I'm a retired high school teacher and a member of the public living in Toronto, 65 kilometres west of the fault line upon which Darlington is built.

Dr. Margaret Chan, who until June of this

year was Director-General of the World Health Organization, said in May of 2011:

> "There is no safe low level of radiation."

This is also my major concern. I agree with her and many other eminent scientists that so-called low level radiation in the form of tritium is dangerous and that too much of it has been permitted to enter our lakes, rivers, air and soil, specifically the Great Lakes Basin and the area around Darlington.

It is present in the food chain and in our DNA, largely traceable to operations at Darlington. I cannot take a shower, eat a bowl of soup or take a walk in the rain without being exposed to tritium. I have not consented to this exposure.

To substantiate this concern, I've used Table 4.1 and Table 5.1 from the tritium hazard report by Dr. Ian Fairlie dated 2007, pages 18 and 20, respectively.

Table 5.1, the average tritium concentrations in the Great Lakes in 1997-98 shows clear differences among the five Great Lakes that can be accounted for largely by the presence or absence of nuclear reactors on their shores.

As we might expect, Lake Ontario has the highest concentration of tritium, and Lake Superior the

lowest. It is patently false to say that nuclear power generators are emissions free. I take background level to mean pre-nuclear and pre-1945.

Since its inception, nuclear power generation, especially in Lake Ontario, has added to the natural or background level of 2 Becquerels per litre found in Lake Superior, which has no nuclear reactors. All subsequent discharges and emissions add constantly to the naturally-occurring generally accepted background level of, to my understanding and to my knowledge, 2 Becquerels per litre.

So my request here would be that in light of all the good science that has been done, I would ask, with all due respect, that CNSC publicly clarify the false association between man-made tritium produced by nuclear power generation and tritium which does, indeed, occur naturally in the upper atmosphere as a result of the activity of cosmic rays to which man-made tritium adds substantially.

I would also ask the CNSC to refrain from denying, diminishing and otherwise misrepresenting the true hazards associated with low level radiation once and for all in its media communications with citizens and the press.

Table 4.1, Tritium Limit in Drinking Water,

Becquerels per litre, also taken from Fairlie, compares Canadian allowable limits with those in other jurisdictions. We share the Great Lakes with the U.S.A., whose EPA allowed 740 Becquerels per litre of tritium in drinking water in 1999.

The European Commission only allowed 100 Becquerels per litre in 1998. The states of Colorado and California permit 18 and 15 Becquerels per litre, respectively. However, we here in Canada are subjected to the foolish and unconscionable limit of 7,000 Becquerels per litre in our drinking water.

Although we share the water with the Great Lakes -- the water of the Great Lakes Basin with the U.S.A., their EPA permits only 10.5 percent of what Health and Welfare Canada allows.

As recently as 2009, the Ontario Drinking Water Advisory Council recommended that the tritium release limit be strengthened, but this request has been ignored by the Ontario government.

As if all this were not shocking enough, in 1994 the Ontario government's Advisory Committee on Environmental Standards, ACES, recommended that the 7,000 Becquerel limit should be reduced to 100 Becquerels per litre for an initial five-year period and then phased in to a limit of 20 Becquerels per litre, which Ontario Hydro

alleged would have cost too much to implement. It was never acted upon.

My request here would be that since the question of how to address the proven health hazard of tritium discharges from CANDU type reactors is not given convincing consideration in this low level EA, I would ask that the ACES protocol be adopted as a requirement for the present review because the current CNSC level of 7,000 Becquerels per litre is socially, environmentally and morally offensive and unacceptable.

In my written submission, I mention the manufacturing of gaseous tritium light sources and the subsequent economy which I believe has assumed a façade of waste management, notwithstanding the construction of its state of the art tritium removal facility. This creates the illusion that tritium waste is serving some useful purpose and is manageable.

You are no doubt familiar with the sorry details of the SSI plant at Peterborough airport which has been shut down since August -- last August.

The CNSC as a regulator cannot claim to be a leader in creating and enforcing a culture of safety in all things nuclear or in taking a truly precautionary approach in this EA as mandated by the *Canadian Environment Assessment Act*.

CNSC is not so much managing nuclear waste as purveying nuclear waste. Following this logic, one can see why more tritium is better. It feeds an economy built upon the selling of hazardous waste which is then made into products all over the world that are also hazardous and end up in landfills or are, as in the case of my own condominium, generously donated to re-store facilities for future use by other unsuspecting members of the test population; the human race.

Time does not permit me to discuss the sale of tritium for use in weapons manufacturing. However, I dare say the market rules and we are all expendable.

My request with all due respect: I request that the Canadian Nuclear Safety Commission, the CNSC, change its name to the Canadian Nuclear Industry Commission, the CNIC.

This would more accurately reflect its true interest in historic activities. Or you could stop selling it and contributing to its spread. You could treat it as the deadly hazard that it is and stop producing it altogether. And keep your name.

According to nuclear analyst, Shawn-Patrick Stensil as well as the historic record:

> “Ten days before the public hearings were to begin on building new reactors

> at DMGS, the Fukushima disaster began on March 11th, 2011."

Fukushima highlighted the cumulative risk of multi-unit nuclear stations such as Darlington. The Joint Review Panel, JRP, refused to adjourn the hearings in order to learn lessons from Fukushima.

However, in its final report, the JRP did acknowledge the need for accumulative effects assessment of multi-unit accidents as follows:

> "The panel recommends that prior to construction, the CNSC require OPG to evaluate the cumulative effect of a common cause severe accident involving all of the nuclear reactors in the site study area to determine if further emergency planning measures are required."

Recommendation Number 63, Section 8.1.

I understand that CNSC has refused to do this in the case of the low-level EA under review here. This review is really three hearings at once. The proposal of relicensing of OPG, the reactor's operator, the relicensing of operations at designated waste sites, and an EA, all at once.

I do not accept that this comes anywhere

close to the imperative and necessary due diligence to which CNSC and OPG are obligated. Nor does the public. Since one day of hearings has had to be rescheduled to four days. And as such I must oppose it.

My final request: In light of all the refusals to listen to reason, to heed climate science, and to act in accordance with precautionary principles which hold environmental and human safety as the highest priorities, especially in our post-Three Mile Island-Chernobyl-Fukushima world, I would finally and most significantly request that this low-level review be raised to a full panel review. So that at the very least CNSC can be seen to take its safety mandate seriously.

At best this would provide the Canadian public with the information and the opportunities they need to fully consider safer and far less expensive alternative energy sources which would safeguard the future of our planet and its biosphere.

If Japan, Germany, Switzerland, Belgium and now Quebec have all foresworn nuclear energy, they are in the vanguard. And Ontario and Canada have the power and the obligation to follow suit.

Thank you.

THE CHAIRMAN: Thank you.

Many of the issues have been discussed in

the last couple of days. Who else wants it?

Ms. Velshi?

MEMBER VELSHI: Thank you Mr. President.

So we have over the last couple of days talked extensively about tritium and different standards and limits. I do have a couple of questions for OPG.

You have said that with practicing ALARA principles, the tritium levels in the drinking water in the lake around the Darlington site are well below even the more stringent 20 Becquerels per litre.

But if that 20 Becquerels per litre, if Ontario were to adopt that as the standard; what impact would that have on your refurbishment plans?

MR. TREMBLAY: Pierre Tremblay, for the record.

I'll ask Laurie Swami to deal with that. It clearly -- as was discussed over the last couple days, the refurbishment project from that perspective really does not have -- you know, is not expected to contribute to this at all. I mean it's kind of an ongoing operation.

One way to look at the refurbishment project is as a large maintenance outage if you will which will take a number of months to execute. But I'll ask Laurie Swami to ---

MEMBER VELSHI: I'm sorry. Let me clarify.

MR. TREMBLAY: Okay.

MEMBER VELSHI: I didn't -- I just mean the refurbishment phase and then that the 30 years post-refurbishment as well.

MR. TREMBLAY: All right. I'll ask Laurie Swami to deal with that specifically.

MS. SWAMI: Laurie Swami, for the record.

As we've discussed previously, the OPG has voluntarily committed to 100 Becquerels per litre in the water supply plans.

And as we have discussed, our emissions result in water supply plans with generally less than 10 Becquerels per litre, somewhere in the range of five to seven Becquerels per litre of the closest water supply plans. And as we go through the environmental assessment with the work that we anticipate for the remaining life of the facility that would not change. And we would anticipate -- again we would continue with our commitment to 100 Becquerels per litre as well as committing to ensuring it is as low as reasonably achievable given the way the plant operates.

MEMBER VELSHI: So again, if the limit were to change to 20; what impact would that have?

MS. SWAMI: Laurie Swami.

We don't anticipate an impact to our

operations.

MEMBER VELSHI: Thank you.

My second question was around tritium sales. And the intervenor has said probably one of the drivers for OPG resisting high tritium standards maybe because there is the economic incentive from tritium sales.

Can you share with us what percentage of the tritium that's extracted actually results in being sold?

MR. TREMBLAY: All right. Pierre Tremblay, for the record.

I'm going to ask Dietmar Reiner to deal with that issue. But it's primarily a very, very small factor.

MR. REINER: Dietmar Reiner, for the record.

I don't have a precise number for you to answer that question directly but we could probably get that. But just to talk about the tritium sales for a second.

There are -- we do pursue commercial opportunities that look at making use of the tritium and examples as have been discussed in the past, the radio-luminescent signs and you know, there are some useful

purposes for that sort of product.

They're used at airports in the event of power failure so that the signage for the runways can remain lit. There are also potential opportunities in regards to helium 3. It's not a core business for OPG so that doesn't factor into our plans for extracting tritium and storing tritium. And the percentages that are actually sold are very, very small.

MEMBER VELSHI: Thank you.

I think it would be helpful if you could provide us what the percentage is of -- that results in sales.

THE CHAIRMAN: Okay.

Anybody else?

Dr. McDill?

MEMBER MCDILL: Mr. President, if you'll indulge me for just a minute, I wonder if I could ask staff to talk about tritium with respect to the light source manufacturers.

Just in general terms of licensing and how it is controlled at that stage for example.

The intervenor raised SSI only sort of peripherally and we have another one as well. But for example, if there is an excess of tritium what happens at the staff level and through the Commission?

MR. ELDER: Peter Elder here, could I just clarify what you wanted… it's excess tritium where, like at?

MEMBER MCDILL: Around the facility in the ground water, I'm thinking back to orders, for example, against facilities.

MR. ELDER: So I, again, I wouldn't say that from that perspective, as soon as we've been aware of any issues around these facilities there has been regulatory action taken to make sure that, you know, they cease operation until all corrective actions are put in place and I won't get into details on SSI which is still shut down at this time and, while the reviews are undergoing. There is monitoring of the tritium around these facilities.

As Dr. Thompson said yesterday we have done independent studies of the tritium levels and the effects on the environment. So we do take the tritium issue very seriously and have extensively studied the health effects of tritium. Again, the reports are on our website.

MEMBER MCDILL: But the Commission has never hesitated to issue an order if an order is required?

MR. ELDER: No or -- or take other regulatory actions in the case of SSI, staff make a recommendation to the Commission that they issue a very

limited licence to essentially, that would prohibit operation of the facility. So it was an order in that case, but it was a change in the licence to say they were allowed to process tritium.

MEMBER MCDILL: Dr. Thompson?

DR. THOMPSON: Patsy Thompson for the record, I just wanted to remind the Commission that two orders were issued for the SRBT because of issues related to inappropriate control of tritium and both of those orders were approved by the Commission and resulted in the facility being shut down for a period and then curtailing operation and very strict controls as to when the operation could -- could operate. I would also say that there’s an information document on the CNSC website, I don’t have the number, I could check, where CNSC staff did a survey internationally of practices to control tritium at those types of facilities and we have a document outlining best practices which are being put in place.

THE CHAIRMAN: Okay, so this leads me to if you look at the first page, the intervenor on paragraph 1, 2, 3, 4, 5 basically insults the federal provincial investigative approach and not only that government risk studies are tainted but not having been done, at arms length from OPG and government. Indeed they have done by consulting firm tied to the nuclear industry. Staff, you

want to -- you want to deal with this and then I'll ask OPG about that.

DR. THOMPSON: Patsy Thompson for the record, essentially the allusions are to risk assessments and limits. What I would say is that the -- the limits that are in place, for example, for drinking water for Health Canada and the -- the province are based on recommendations from the World Health Organization and are very consistent in approaches with what's being done internationally.

I would also say that all the risk assessments are done for the CNSC, for example, for -- for licencing, we have a large number of technical specialists who do a detailed peer review of those risk assessments and on a large number of occasions, for example, for tritium, because tritium and health issues were important to the public the information document that we have, Information 0799, was peer reviewed by independent experts in the draft stage. We addressed all the peer review comments the document has published and from that document we also have published in the scientific literature a paper which will be available on the internet in December we were told.

And so a lot of the work that the CNSC does in a risk assessments related to the activities licenced

by the CNSC are peer reviewed independently and on many occasions lead to scientific papers and peer-reviewed journals.

THE CHAIRMAN: Yesterday you were criticized on some of your studies.

DR. THOMPSON: Yesterday the criticism was related to our reanalysis of the -- for the nuclear workers that were included in the International Agency for Research on Cancer, a 15 country study and when I mentioned that we had reanalysed, the implications were that we were fixing the data to get an answer we liked. And what I would like to say is that in 2005 when the IARC study came out CNSC staff were concerned that there are risks that we were not taking into consideration that -- that we needed to deal with and so the first thing we did, we contacted the IARC. We met with the lead research scientist, Dr. Elisabeth Cardis. We met with her, received the study protocol and the study protocol essentially identified that of the Canadian workers cohort that had been sent to IARC the Ontario Hydro workers had been excluded from that study because there was more than 50 percent missing information on socioeconomic status because in the 15 country studies, socioeconomic status was a compounding factor because it affects the health outcome. Poorer people tend to be more sick.

And so the IARC 15 country study, the Canadian portion is highly represented by AECL workers and so after that meeting what CNSC did was we contacted OPG, not Ontario Hydro anymore and we asked them if they would be willing to engage in a significant exercise to obtain socioeconomic data for the Ontario Hydro workers that were part of the Canadian cohort. Ontario Hydro, OPG, did provide, did do that exercise, so we updated the Canadian cohort for the Ontario Hydro workers to have the socioeconomic information.

We also looked at studies that had been done in the 90’s and realized that there was a difference in the risk factors for Canadian workers and so we did further investigations with Health Canada, the National Dose Registry. We updated the information in the National Dose Registry because in the early part of the dose registry the information being sent to the NDR was incomplete and so we went back to facility records, updated the information in the National Dose Registry and also we added the tritium doses which weren’t -- were not being sent at the time in the -- before 1978 about and so all of that information has been taken and reanalysed and the results are that there’s 42,000 and some odd number of workers that represent Ontario Hydro, Hydro Quebec and NB Power and AECL workers after 1964.

All of those workers we see no radiation risk. The radiation risk is negative, so there's no relationship between radiation exposure and health but there are 3,000 early workers of AECL before 1964 for which we still have questions and we're continuing those investigations.

THE CHAIRMAN: Okay, thank you. I think you had the last word there.

MS. CHERRY: Sorry, not used to this equipment. Thank you for hearing me. Thank you for convening the -- the hearings. I just want to say I suppose that there is no safe dose and no acceptable risk for humanity in my view, thank you.

THE CHAIRMAN: Okay, thank you. The next submission is an oral presentation from Mr. Azzopardi as outlined in CMD 12-H13.84. Sir, the floor is yours.

12-H13.84

Oral presentation by from

Robert C. Azzopardi

MR. AZZOPARDI: Good morning. Thank you for the opportunity. I brought my own water. It is reverse osmosis. We have a lot more in our water supply than tritium. Unfortunately reverse osmosis does not

remove tritium.

I will read my statement to make sure that I cover all my points within the allotted time; 10 minutes seems to be very minimal.

I do not intend to answer any questions after my statements nor will I attempt to match wits with the very well paid and so called experts from the OPG or the CNSC.

I am here today as a father, a grandfather, a citizen and a taxpayer. My presentation will be based on facts and experience.

In my 73 years of life on this planet, I have watched and not acted as millions on innocent people died in wars fought over resources.

I have watched a regulated tobacco industry glamorize their product and deny any association to illness for 50 years while I watched my father die before his 50th birthday from smoke and related heart disease.

I have watched as my younger brother died of cancer from unknown causes.

I have watched as my brother-in-law died a horrible death because of his exposure to regulated asbestos at Johnson Men’s (phon.) school.

I have watched as regulated DDT was sprayed on children in their schoolyards to prove its safety.

I have watched as regulated PCBs were finally labelled a carcinogen.

I have also watched as regulated industrial chemicals including dioxin polluted communities around Love Canal and still continue to spill their poisons into the Niagara River and Lake Ontario, the drinking water supply for millions of people.

We continued to watch as the regulated petro chemical industry denied global warming while destroying our oceans and environment.

We see Monsanto’s attempt to convince us that regulated, genetically modified foods are as good for us as organic.

We watch as regulated chemicals in our food are labelled human carcinogens.

We are now faced with a decision to extend licences and extend the life of nuclear reactors at Darlington to 60 years.

We are told that all is well and not to worry because the regulators will watch out for our welfare.

Governments and regulative agencies have been wrong so often that believing in your assurances is tantamount to stupidity.

For those who are unaware at the beginning

of the nuclear power renaissance, let me point out that prior to 1950 nuclear reactor’s only purpose was to produce plutonium. In June of 1950, Dr. Charles Thomas, Executive President of Monsanto sent the first concrete proposal to the Atomic Energy Commission that the time was right for the industry to begin building dual purpose reactors to provide both plutonium for weapons of mass destruction and to profit from producing electricity from the excess heat.

There are now 19,000 new nuclear weapons on the planet. In October of 1952, the Atomic Energy Commissions Publication Reactor Signs and Technology publicly announced that a number of industrial and scientific organizations were on board to build dual purpose reactors, namely Monsanto, Union Electric, Dow Chemicals, Detroit Edison, Common Wealth Edison, Argonne National Labs and Pacific Electric.

They all agreed at the time of building reactors for producing electricity exclusively was not an economical possibility. We’re all aware of this in Ontario because we pay our debt retirement fee on our hydro bills.

The only reason nuclear has existed in Ontario and survived is because of our subsidies.

Let’s talk about the safety of nuclear

power. OPG stated on a number of occasions that there is a chance of one in a million of an accident happening at one of their reactors.

I don’t know if the million -- one in a million is in years, months, days of hours of operation. I may not be good at math but in the past 30 years, we have witnessed six catastrophic reactor meltdowns out of 436 existing reactors worldwide.

This is more than a one per cent failure rate. I may be bad at math but I certainly would not get into a car or a plane with a failure rate of one per cent. Would any of you?

The levels of ionizing radiation are a real concern. Dr. Helen Caldicott who has appeared before you in the past has warned that there is no safe dose of ionizing radiation.

By the way this is a Geiger counter. I don’t trust you and I do, do my own monitoring.

In Canada, levels of allowable tritium in drinking water is 7,000 Becquerels per litre. It is 100 in Europe as you’ve heard so many times during these sessions and 15 in California.

The study Chernobyl: Consequences of the Catastrophe for People and the Environment published by the New York Academy of Science in 2009 concludes that the

Chernobyl manmade disaster is responsible for up to 1,000,000 deaths and deformed children are being born yet today 25 years later.

Fukushima seems to be off the radar screen of the national news but it is not over.

Arnie Gundersen, a 40-year veteran of nuclear power engineering, a licensed reactor operator and a former nuclear industry senior vice president has warned that the reactor for spent fuel pool is very precarious and that if it fails it could cause the evacuation of Tokyo and affect most of the Northern Hemisphere.

Seismologists in Japan speculate that another major earthquake will hit the area within the next three years. Engineers stated that the pool has very little structural integrity.

The independent report on the cause of the Fukushima nuclear events puts the blame on wilful negligence and a collusion between the government, regulators and the industry.

I don’t know, how much living in Ajax most of our lives, since 1951, has contributed to the early cancer death of my brother and the two incidents of leukaemia in my family.

What I do know is there is absolutely no history of either one of these diseases ever occurring in

our past.

Let’s discuss the economy of nuclear. The limited liability of 75 million will do nothing in the case of a nuclear disaster and the taxpayers of Ontario will foot the bill for the clean-up.

OPG states on their website they have set aside 11 billion for decommissioning of Ontario’s 20 reactors and sequestering the nuclear waste that today amounts to 46,000 tons.

My research indicates that it will cost at least twice as much money to decommission a reactor as it takes to build one, even if it’s possible.

In 2007, the OPA estimated at building two new reactors at Darlington worth $6 billion or $3 billion each.

In 2009, cost was estimated to be 26 billion. If we even take the lower 2007 figure of 3 billion times two, OPG will require $120 billion to just decommission Ontario’s reactors.

What about the long-term storage and protection of the 46,000 tons or more of nuclear waste? No one can estimate the cost of sequestering and protecting nuclear waste for up to 250,000 years.

Nuclear power is neither clean nor cheap. We must discontinue this insanity and call for a shift

away from nuclear immediately and switch to hydro from Quebec until we can build a renewable energy grid as countries such as Germany are in the process of doing using solar, wind, geothermal, biogas, just to mention a few.

Exactly a month ago today, the German utilities industry association, BDEW, said that from January to December -- September, sorry -- January to September this year, nine months, all renewable energies combined accounted for 26 per cent of electrical production.

This is in conflict with yesterday's OPG estimate of 5 per cent. For those communities who support the nuclear industry and your concern about losing jobs have no fear.

You'll be busy busy taking care of the radioactive waste for 250,000 years and decommissioning the radioactive reactors. You may not be safe but you will be well compensated with money.

I want to discuss a little bit about your evacuation plan. Any plan for evacuation is doomed to failure. You have all travelled on our highways during rush hour when a small fender-bender creates gridlock.

My attempt to travel from downtown Toronto to Milton last Friday, a trip which usually takes 40

minutes took four hours because of slight snowfall which hardly fell on the roadway.

Can you imagine the chaos and gridlock which would occur if a nuclear accident happened during rush hour in a snowstorm or on a busy summer weekend?

Have you set aside enough money to airlift nearly a million people to safety? Who are you kidding?

As my conclusion, and please understand that I really feel very passionate about this and I'm very emotional and possibly nervous saying this.

Most of the intervenors opposed to the extensions are here on our own time in the interest of protecting our families and our communities. We have jobs, we have families and we had to leave -- which we had to leave to attend these sessions.

I beg you to do what is right. Search your conscience. No industry deserves protection. Has so much risk attached to it when better and safer alternatives are here and right now. Consider your grandchildren.

The nuclear industry is nearly 70 years old. And it is either in its infancy or senile. Their diaper is full of BS and very toxic waste. They need a change and so do we.

Thank you.

THE CHAIRMAN: Thank you

MR. AZZOPARDI: By the way, I still have a moment or two. This has spiked from .08 to .037. I know gamma radiation but it certainly indicates there is something to be concerned about.

THE CHAIRMAN: Thank you.

The next, the next submission which is an oral presentation from Ms. Shah as outlined in CMD H13.85.

No?

MR. LEBLANC: Is Ms. Shah with us? We were trying to locate her all morning without success. So as she's not here we are going to go the next submission. Thank you.

THE CHAIRMAN: The next submission is by a group of engineering students studying at the University of Ontario Institute of Technology as outlined by CMD H13.152. And I understand that Mr. Price will make the submission. Please proceed.

12-H13.152
Oral presentation by a group of engineering students studying at the University of Ontario Institute of Technology

MR. PRICE: Good morning.

Respected member of the Commission, we are a group of students from the University of Ontario Institute of Technology and today, we would like to present to you an exposition of what 49 under-graduate and graduate engineering students feel is their perspective on the Darlington refurbishment project.

We're all soon to be professionals who have devoted our best -- at least four years of our thus short lives to the study of science and technology and we are all very concerned about our future. Thus the theme of our exposition will be that of the future.

Our exposition shall offer three major topics; our future employment as professional engineers; the future of the economy in which we will conduct our lives; and the future of the environment of the planet on which we'll live.

MR. SABERI: Hello, Ashkan Saberi, fourth year nuclear engineer.

The first item on our presentation shall be the future employment as professional engineers. As engineering students, we've gone through very intensive programmes doing our degrees. Thirty five hours of in-class is not unheard of and we're not to not overlook the countless amount of hours spent in doing assignment labs and studying.

These four years serve as a major time investment for our future and we put our lives on hold and study so that we may have a brighter future.

The Darlington refurbishment project and continued operation at Darlington will require thousands of engineers to perform. Such a major project is to provide a bright future for many of us who eagerly await employment. We are concerned that if projects such as this are not approved then all our time and efforts have been rendered uninfluential as we experience underemployment or unemployment in order to provide means to our continued livelihood.

Furthermore, in extremely specialized engineering disciplines such as nuclear engineering, if we are unable to find employment in Canada then we will be forced to research abroad to find suitable employments.

Let us not forget what happened to the aerospace sector after the cancellation of the Avro Arrow project. What will happen to Canada’s nuclear sector if the nuclear industry is allowed to decline?

MS. MENON: Niv Menon, fourth year nuclear engineering student.

This brings us to our second item; the future of the economy. We as young people look forward to a continuously increasing standard of living made possible

by the advances in science and technology. Future operations at Darlington will provide gainful employment for thousands of people and it will be a boon to the science and technology sector. These jobs will stimulate the economy and in particular the science and technology division.

The very existence of this ever increasing standard of living is enabled by the growth and development of science and technology. We would like to submit to the Commission the proposition that perhaps investment in a project related to science and technology such as Darlington may have many indirect benefits to the economy beyond the direct creation of jobs.

By stimulating science and technology, you stimulate one of the key driving forces of economic growth and prosperity. If the operation of the Darlington nuclear generating station is not continued then where are the thousands of skilled workers and professionals to go in order to continue their careers?

Yes, it is true that there are many other industries to absorb them but it is irrefutable that discontinued operations at Darlington will have a major impact on science and technology and alter the direction of Canada’s economy.

Finally, we would like to discuss the

future of the environment. We are gravely concerned with the future of our planet’s eco-system. The scientific consensus is overwhelming in the favour of the position that man-made climate change is a real phenomenon.

As our planet’s population soars past 7 billion people, each with an expectation for an increasing quality of life, we must come to some real answers as to how we will provide the quality of life to each and every one of them.

A major factor in this expectation for globally increasing quality in life is a demand for an ever increasing amount of affordable and reliable electricity.

Ontario’s demand for electricity is to grow by 15 per cent in the next 17 years. How are we to provide this energy?

To answer this question one might be tempted to fall into a fractioned, idealistic argument of renewable versus fossil fuels versus nuclear. However it is possible to move past this argument with a simple criterion. Whichever provides the most electricity and produces the fewest greenhouse gases. It is clear that nuclear energy meets this requirement exceedingly well.

Nuclear energy provides abundant, reliable and safe electricity without any direct greenhouse

emissions.

MR. PRICE: With these points being made, we'd like to conclude our case with the following request to the Commission.

We, as future engineers in Canada, request the Canadian Nuclear Safety Commission pass whatever motions be necessary to ensure the future operations of the Darlington Nuclear Generating station including but not limited to the authorization of the Darlington refurbishment project, the construction of the Darlington waste management facility and the extension of the Darlington Nuclear Generating station operating licence.

THE CHAIRMAN: Thank you.

It's open.

Questions? Monsieur Tolgyesi?

MEMBER TOLGYESI: Your university curriculum gives you a technical scientific knowledge in preparing you for future, does it also teach you challenges; what the industry is facing on operational and a waste management and a long-term challenges?

MR. PRICE: We do do a course on waste management. Perhaps Ashkan would like to answer this?

MR. SABERI: Actually, we've recently had a course on radiation waste management with Dr. Brian Ikeda. In this course, we go through the various different ways

to store low-level, intermediate-level, very low-level and a high-level waste. In addition, we do mock-up commission -- commissioning phases within our class in large groups where we would expect to have in industry.

MR. PRICE: So I guess the direct answer to that question is yes, we do have some exposure to some of the issues related to waste management and such.

THE CHAIRMAN: Thank you.

Anybody else?

MEMBER TOLGYESI: And how far are you aware of concerns of citizens around the nuclear stations? You know, what we are hearing here. There are some, they are concerns expressed. So to what extent do you integrate that also to your education?

MR. PRICE: We have pretty extensive exposures to concerns regarding radiation and its hazards. The Canadian Nuclear Society at the school has had a lot of talks on some of the dangers about radiation, especially low levels of radiation. Here, from the talks this morning, this is -- one of the primary concerns is the low levels of radiation.

So we are exposed to it and we are aware of it. We don’t live in a kind of a bubble.

THE CHAIRMAN: Well, that’s -- in your second page, you don’t have page numbers. That’s the

first thing I thought you should do in university, right.

(LAUGHTER/RIRES)

THE CHAIRMAN: So on your one, two, three, right above your names there is a paragraph that start your skip on that one, that's start as an astute opponent of nuclear energy, as an astute opponent of nuclear energy might argue. What you're saying here is that the environmental impact of these disasters are not as catastrophic as some might argue, but then you argue that this is not the place to argue the safety case. In fact, this is the place to argue the safety cases. So what did you have in mind when you drafted this paragraph? Why did you skip it?

MR. SABERIE: The ten minutes we were allotted, we thought that we wouldn't have enough time to present all the information in the report. However, as nuclear engineers, we've gone through very extensive programs to study exactly every component of the plant, of the CANDU plant that we have in Canada, and we strongly believe that our plant designs are very safe and we think that though we shouldn't, you know, you should never think that you're susceptible to accidents.

We think that we have a very safe plant design and we think that through -- we can improve our plant further and I think that our safety culture in

Canada is good enough to prevent accidents from occurring in the future.

THE CHAIRMAN: So you're not worried about the future of nuclear in Canada?

MR. PRICE: Oh, absolutely we are. We wouldn't be here otherwise. It's true, there is a lot of risk in nuclear power and we do go through a lot of training to try and understand this risk and understand how dangerous it is. I wasn't trying to kind of downplay the risk involved with it or anything like this. I think, what I was referring to in the paragraph, is more -- there's a lot of media hype about radiation risk and radiation hazard that gets thrown around.

THE CHAIRMAN: Okay, thank you.

MEMBER TOLGYESI: How far and how much do you know about Canadian Nuclear Safety Commission?

MR. SABERIE: We know enough of your regulations. We've used them in our day-to-day calculations and our report writing and also we've actually got an intern here that is from UIT who is on the Canadian Nuclear Safety Commission. So yes, to answer your question, we do an extensive -- we know an extensive amount of the regulations that the CNSC enforces and how strict they are.

THE CHAIRMAN: Okay, thank you. Thank you

very much.

MEMBER McDILL: I wish you good luck on your Christmas exams.

MR. LEBLANC: Is Mr. Mark Reid in the room? So if Mr. Reid is not here, we're going to proceed with the next submission. Thank you.

THE CHAIRMAN: The next submission is by the Regional Municipality of Durham, as outlined in CMD 12-H13.88 and I understand that Mr. Cubitt will make the presentation. Please proceed.

12-H13.88
Oral presentation by
Garry Cubitt

MR. CUBITT: Good morning Members of the Commission. Welcome to Durham Region. My name is Garry Cubitt and I am the Chief Administrative Officer of the Regional Municipality of Durham.

I am joined today on my right by Mr. Brian Bridgeman, who is our Director of Current Operations, Planning and Economic Development and on my left by Ivan Ciuciura, our Director of Emergency Management.

My remarks will address the three items under consideration by the CNSC today relating to the

ongoing operation and refurbishment of the Darlington Nuclear Generating Station.

The Darlington Station is located in the southeast corner of Durham Region in the Municipality of Clarington, as you know. By way of context, the Region operates within what is known as a two-tier system of local government. The Regional Municipality of Durham is the upper tier, or senior level of local government and within the region are eight lower tier local municipalities, including the Municipality of Clarington.

Therefore, both the Region and Clarington 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 for the Darlington Nuclear Generating Station, Durham Region has a substantial interest in the continued safe operation and the proposed refurbishment of the plan.

Darlington Nuclear Generating Station is a major employer in our region, providing high skilled, well-paid jobs for our residents. Refurbishment will bring additional jobs to the region for the 12-year

duration of the project and generate positive economic spin-offs within Durham’s borders and beyond.

The Region of Durham strongly supports the proposed refurbishment project.

In the summer of 2011, the Region undertook a peer review of the draft EA documents for the refurbishment project. As a result of that process, OPG revised the EA document to address some issues the Region identified. These items related to mitigation of impacts on the transportation network and discussion of anticipated effects on regional social services.

The Region forwarded a copy of its Peer Review Report to the CNSC in the fall of 2011. Some issues identified by the Region during the peer review were considered by OPG to be beyond the scope of the refurbishment EA, but OPG did agree to do some additional studies with the region of anticipated fiscal impacts of the project.

The influx of temporary and transient workers during the construction phase is expected to put some pressure on regional services, for example, roads, transit, ambulance, potentially affordable rental accommodation.

Transportation system impacts related to the construction phrase were also identified by the region

in the peer review.

OPG has provided us their assurance that they will mitigate these effects by developing a traffic management plan with the transportation agencies involved, primarily the Ontario Ministry of Transportation Durham Region and the Municipality of Clarington.

The traffic management working group has adopted a terms of reference and has in fact met several times. As OPG is aware, the roads projects identified by the Region to support the refurbishment are not in the Region's current five-year capital plans. OPG understands this and that any needed expansion of the regional road network would require three years to complete the EA design and construct the improvements.

Funding by OPG is understood to be necessary to advance the timing of these works prior to the refurbishment project getting under way.

OPG is also aware that if the construction phases of Darlington refurbishment and the proposed new nuclear project overlap, congestion on the regional road network in the Darlington area would be amplified. And we appreciate OPG's efforts to date and encourage them to expeditiously address the regional road work needed to support these important projects.

Potentially the region may be affected by

three large OPG projects simultaneously. The Darlington refurbishment, the new nuclear and the Pickering closure concurrently are in close succession. Durham may need to provide additional services and we anticipate that OPG will continue collaborative efforts with the region to ensure that the region's physical and human infrastructure can support these endeavours.

With regard to the renewal of the reactor operating licence, the region strongly supports the generating station being refurbished and thus, extension of the operating licence.

The region also wishes to comment on the removal of the Darlington waste management facility licence renewal. The peer review identified that the key impact on the region of the refurbishment project would be the increased onsite storage of nuclear waste from the replacement of the reactor components and used fuel from 30 additional years of operation.

While we are absolutely confident that the nuclear waste will be safely and securely stored onsite, we are concerned about the length of time that it will remain at the generating stations.

Regional council went on record in June of 2010, as being "Strongly opposed to long-term storage of used nuclear fuel at the nuclear stations in Durham."

In the context of the lives of Durham residents, the used fuel storage that already exists and is planned for Durham reactor sites, is long-term.

The recently released nuclear waste management organization five-year work plan outlines the various assumptions on which a 2035 completion of the deep geological repository is predicated. Many factors may cause delay.

Once the deep geological repository is open the process for repackaging, then removing nuclear waste from the current storage facilities, is expected to take some time.

Durham Region is looking for assurance that the nuclear waste will be expeditiously removed from Durham sites when possible. In considering expanded waste storage at the nuclear site, we encourage the CNSC to ensure to the best of their ability that the urgency of developing a permanent storage site is not diminished and that these projects are in fact connected.

As a reactor host community, the region would consider it a gesture of good faith if OPG and the nuclear waste management organization would consult us on, develop, and share plans and timelines for removal of the nuclear waste as soon as the deep geological repository site is selected.

In conclusion, the region continues to be strongly supportive of the refurbishment of the Darlington nuclear generating station. We urge OPG to continue its collaborative style with the region to ensure that any concerns about the project are addressed.

And we thank you very much for the opportunity to make our presentation.

THE CHAIRMAN: Thank you.

Question? Dr. Barriault?

MEMBER BARRIAULT: You mention that you're expecting some traffic congestion during refurbishment construction. Have you analysed what impact this would have if you had to evacuate the area in the event of an emergency?

MR. CIUCIURA: Ivan Ciuciura, Director of Emergency Management for the region.

There have been studies -- evacuation time studies done by OPG for the new build project and it took some of that into consideration.

In addition, the Ministry of Transportation of Ontario has hired a consultant to do an additional evacuation planning and much more detailed study than what's been done to date. So we are looking forward to that.

MEMBER BARRIAULT: When do you expect the

plan to be in place? For example, if you were to have a problem tomorrow, how would you deal with it?

MR. CIUCIURA: We do have plans in place right now and I think I mentioned before, more importantly we have a structure in place to respond. And the structure is very important to understand.

And that structure is that there are emergency operation centres at the municipality, at the region, at the province, and all those organizations inside at police, at social services. So all those organizations have -- get senior staff together that the -- really the job is to problem-solve. So the plan -- what the plan is to do is to divide what the responsibilities are of all the organizations and that’s a key.

But when the event happens, it’s these operations centres or that structure that makes it happen. So if there is an unplanned -- and a planned -- if I can paraphrase General Eisenhower during the Second World War said something to the effect that “All plans are rubbish, but the planning process is everything.” And that planning process we do. We do have plans. We have all those organizations together.

If the plan isn’t unfolding -- and another one by the military, it says -- you know, “No plan will

survive first contact with the enemy" which means you plan for it. It's never going to unfold as you plan, no matter what. It won't go that smoothly. So you have to problem-solve. And I think in the region, and in the province and in the municipalities here, we do have a good process in place that you will problem-solve.

So back to your question, if it's not planned for, if there is something that doesn't -- not going unfolding as it should, the joint traffic control centre at the provincial level with all the police forces -- we have a regional traffic control centre with the Durham Regional Police who have a plan, they will solve that problem and try to expedite.

MEMBER BARRIAULT: Have you had the opportunity to test any part of this plan to date?

MR. CIUCIURA: One of the problems with emergency planning is on large scales, you can't -- you can't really test it.

Other than -- let me point out -- I mean there is an emergency evacuation every day. And it's in the City of Toronto. Every day at five -- you know, between three and five and if anybody's been down there, it's grid lock.

But it's grid lock but it clears out. It does work. And that's -- I've had discussions and I

wouldn’t say arguments but with the traffic management and one of the studies were done as to how -- you know, the evacuation of Darlington anywhere from three to nine hours. And that’s worst-case scenario. And they have factored in other people that are evacuating outside the area; worst-case condition for roads.

It takes a long time but what you’re trying to do is get the people outside of the danger zone. So you’re not trying to evacuate yourself from Toronto back to Durham Region. All you’re trying to do is get outside of that 10 kilometre zone as it is right now for us. So that you might be only driving five kilometres, you might be able walk that fast but those cars stop and go. In five hours, you will be outside of that danger zone. And that goes for chemical spill or anything else, the same type of thing.

So that’s the only thing I can point you to. You can’t have the whole population do a -- you know a practice evacuation. And then you have things like hurricanes --

THE CHAIRMAN: But -- sorry to interrupt, but you know we hear it time and again and they’re using exactly what you just said.

And they -- so if -- you know, say give us a break. You know you say that the grid -- traffic

blockage, so they jump to conclusion that don’t -- that you cannot have an orderly evacuation.

So how do you reach to the public to say that -- all the things that you’ve said? That first of all it’s not going to be instantaneous, it’s going to roll over time and you got a plan I assume.

It’s -- we’ve heard now for the last couple of days, everybody keeps saying look at the traffic and therefore, there’s no evacuation plan. We don’t know how to do that. So how do you respond publicly?

MR. CIUCIURA: Ivan Ciuciura.

Just to go back, we do have an evacuation plan.

Durham Regional Police has an evacuation, traffic and monitoring plan. Police cruisers do go out at key intersections and they can -- number one, monitor the flow and if they have to, they can intervene.

We have a regional traffic control centre that’s set up with police in our works department. And our works department run all of the traffic lights. A lot of those lights are automated. They have a huge board and you can see the -- actually can see the traffic build-up of intersections and they can change the lights to speed up one way or the other.

The other thing I can say that it’s never

static. We're -- I mean we continue to work on this. We continue to have meetings. We continue to do exercises. Every year, we do have a full-scale field exercise in the region at one of the emergency centres that gets set up. We do have exercises with our municipalities every year so that again, that structure's tested.

So I'm not saying that it's going to be smooth and go like a -- it won't be. It certainly will be controlled chaos but there will -- that there's a system that I think will certainly get people out. It won't be easy. And the more population, yes, it does make it more difficult.

THE CHAIRMAN: I'm just talking about the communication for the public. How do you explain that you do have a plan and you expect the plan to work?

MR. CIUCIURA: Ivan Ciuciura again.

We do have the information on our website. We go out to community days in Oshawa. We go out to community days here in Clarington. They have a great safety days where police, fire, EMS, my office goes out. We hand out brochures on -- you know, the nuclear planning. We have the information on our website. Anytime we have an exercise we do advertise it in the paper.

It's one of the most difficult jobs though,

from an emergency management point of view -- like my job is to write plans, train people, do exercises to test the plan and do further training. But the fourth component is public education. And that's an extremely difficult job no matter -- I mean it's nuclear and non-nuclear.

Actually I think I have -- we have just redone our brochure and I did throw it in, "Are You Ready."

That's being sent out to every resident in Durham region. And you get mixed reactions. The first time I did that about 10 years ago, the first time I put it around there was a letter to the editor saying that this is a waste of time and that my office should be -- should be cut from the regional budget.

So it's tough. I've been on -- I'm going on -- I've been on two local radio -- sorry, television programs; live television call-in program on emergency management. I should have learned better the second time but the first one -- at it's a local television station that -- and a good program. But again this call-in, it's about how to prepare -- how to be prepared for emergencies and that type of thing.

The number of calls for both of those one-hour sessions: zero, none. So having to kind of extend that to fill that one hour show.

All that is to say, we still try. There's information on the website, brochures like this do go out. We go out into the community. We -- my staff is available to go out to any groups. And we do. And we go out to talk to girl guides, to younger groups to get the word out that being prepared.

And the preparedness here is, be prepared to stay in your home if you had to, and shelter in place. And the other one is be prepared to evacuate. And that's for any situation. So it's not just nuclear.

THE CHAIRMAN: Thank you.

Dr. McDill?

MEMBER MCDILL: Thank you.

We have the benefit up here of seeing the people behind you reacting.

So if there's any kind of emergency in the area, it doesn't have to be nuclear, as you say it could chemical; if there is no power, the communication centre will be struggling to manage on backups, backup power, backup communications.

At that point, it's unlikely that your website will be accessible in the community. At that point, this is when the community will need the most to be able to communicate with you. And many of us in Ontario have gone through a number of things like the grid

failure, a number of summers ago when cell towers couldn't accommodate the load from the community trying -- just families trying to reach each other and I was one of those. All the traffic lights went on four-way red flash, which has a methodology if people follow it to get through.

So in reading all these interventions, you know a hundred oral or a hundred written, it's something that comes up in almost every single one. Is that the community -- communities feel that they don't have enough information. And I hear that you are trying to give them the information. Most people will want the information the moment they need it and perhaps not the day before or -- you know, it is the way it works. There was a small earthquake in Ottawa. And everybody wanted to know, was it an earthquake? That's basically what people wanted to know. Was it an earthquake? And there were difficulties within the government servers to deal with the number of requests online to get this information.

So my sense is that the communities don't feel they have enough information at this point. You're trying to give them the information but I think, especially looking around as I can see the faces when you speak. And it's a barrier I think to the situation.

I guess, would you care to comment?

MR. CIUCIURA: Ivan Ciuciura.

I have to agree. It is a barrier. And I've tried to point out that it's one of the most difficult issues to get out. But I can give you another example.

We're putting in public alerting sirens within three kilometres around the nuclear plants. I sent out a brochure to every household in that three-kilometre zone. Two weeks later, I've got a CBC television crew with me. They stop people in the streets when we're sounding the sirens and they say "Well, yes I hear it but I don't know what it -- you know, don't know what it means."

So we have lots of work to do. What I'm just -- use that as an example that we keep on. It's a challenge for every emergency management. And not just nuclear but it's a challenge to get that word out.

Back to your point. If something -- I don't expect people to be logging on for information if it's a nuclear emergency. I mean it has to be mass media. It'll be out on the province within 15 minutes within a serious accident. That nuclear station will be giving direction to the region on what offsite actions we were to take. They will also be issuing emergency bulletins by radio and television. And that's the information that will get to

the public. This has occurred, you know, what to do and stand by for more information.

That'll probably be, in my view, the primary way of doing it. The media will also be onto the story faster than probably that 15 minutes that we have for the province to make those decisions.

We've had instances in the past where an exercise at an OPG, it was at Pickering, it was an exercise. But somebody, it was a contractor on the exercise, left the plant, went to the school to pick up his child. The principal phoned the school board, the school board of which we have good relationships with, phoned my office and said what's going on. Back to the plant, no there's nothing going on. But that's the type of word of mouth and the media. Any story like that I'm -- will get out.

Now you still have challenges. At night time, people are watching television so that's why we still need to work on public alerting measures and have all those backups in place.

THE CHAIRMAN: Okay. Thank you.

Anybody else has a --- Ms. Velshi?

MEMBER VELSHI: One of your key concerns you have mentioned in your submission is the long-term onsite storage of used fuel and wanting some reassurance

that the NWMO actually has a long-term solution in place by 2035.

But as you, yourself, outlined that is the best-case scenario. And so if that got delayed and I don’t know if the person from the NWMO here is, but -- and what the worst-case scenario is, I just wondered what that would mean for your support for this project? And what are your concerns for really extensive long-term storage onsite of used fuel?

MR. CUBITT: Garry Cubitt, for the record.

Regional council certainly has reiterated a number of times its strong support for the project. So I wouldn’t tie the two; I wouldn’t make an assumption that that long-term storage would therefore negate that.

That would be something that council would have to reconsider. At the same time council has said “We are concerned about long-term storage and we really encourage the nuclear waste management organization to continue in its efforts as expeditiously as possible to reach a long-term solution and facilitate the removal of the stored material from Durham.”

While that is their political position and their desire for the project, they also recognize at the same time that the storage of waste in Durham is safe and secure and they don’t have concerns about that. They have

just expressed in their conversations and in their council meeting their desire to not see Durham seen as a long-term waste storage option. They would prefer that material be removed as expeditiously as possible.

THE CHAIRMAN: Okay. Thank you.

We have to move on. Thank you.

Thank you very much.

The next submission is an oral presentation from Ms. Baluyut -- I hope I pronounced it right -- as outlined in CMD 12-H-13.101 and 13.101A. The floor is yours.

12-H-13.101 / 12-H-13.101A

Oral presentation by

Rhea Baluyut

MS. BALUYUT: Thank you Commissioners and hello OPG staff and CNSC and public.

I apologize first of all because I'm a bit congested today and I will do my best to keep it within the 10-minute.

Okay. So my name is Rhea Baluyut. I'm a homeowner and attend school in Mississauga and work in the GTA. I was born in the Philippines and came to Canada in 1987. In the past couple of years, I've taken a closer

interest in current affairs, particularly in relation to environmental and social responsibility.

I would like to point out however, that I'm in no way an expert in any studies, nor would I claim knowledge in the science of environmental and social welfare. I am here today simply to represent myself, and my personal concerns with Ontario Power Generation's proposal to reconstruct the Darlington nuclear power plant.

First off, I would like to state that as much as I appreciate the advantages we have in Ontario and our steady supply of power, I do believe that true sustainable energy comes from alternatives other than nuclear. That being said, I am fully cognizant of the fact that as much as I would be elated to see our evolvement towards more sustainable and very attainable greener practices, I can appreciate OPG's current strategic business imperatives surrounding this reconstruction.

Ultimately I believe we should halt OPG's proposed reconstruction plan but at the very least, reassess the plan and provide the public with clear and thorough information about what matters to us most, impacting us today and generations to follow.

In reviewing the environmental assessment,

I am both disappointed and concerned about the lack of transparency on some very important points mentioned including some not mentioned at all such as the design flaws in the Darlington reactors, lack of emergency procedures set in place in the event of a large-scale accident, and most importantly, I found it quite concerning that the impact to our lake is not taken more seriously.

With respect to design flaws from what I have been learning about the CANDU design, defects exist such as -- that are considered similar to the Chernobyl RBMK reactors such as the positive reactivity design, allowing for rapid increase in reactor power during coolant voids. This in itself in my opinion is an extreme concern as it allows for the probability of an explosion. The fact that such a probability can be avoided simply by reassessing the design of the Darlington reactors should be taken as a very much needed safety precaution which in essence would be considered a wise investment after all in my opinion.

I’m also very concerned about the fact that our Darlington reactors share one containment system between four reactors. Even with separate containment systems, it did not avoid the release of radioactive material in Fukushima. I do not understand why this has

been discounted in Darlington. Bottom line: all reactors have flaws and the *Nuclear Liability Act* demonstrates that.

I believe that it would be to our detriment to assume that even after the onset of past events such as Chernobyl, Three Mile Island, Fukushima and 911, assuming that no such tragedy could occur in our own backyard would be premature to say the least.

I question why in the environmental assessment there's no mention of plans set in place should a large-scale accident or state of emergency occur. It ceases to amaze me that for such a large-scale undertaking, where such an emergency is possible impacting not just employees of OPG but also the community surrounding the power plant, that a public review of a large-scale accident has not been made available.

Suffice it to say given the precautions that both U.S. and Canadian military have taken since September 11th why is the nuclear industry not taking the same precautions towards terrorism? In my opinion, given the relative location of Darlington, this is an imperative mention that should have been included in the environmental assessment.

I'll mention again the *Nuclear Liability Act*. What is even more concerning is that OPG requested

this Act to be passed that in the event of an accident it's only responsible for up to $75 million to repair damage caused and that OPG suppliers are absolved of all liability towards victims that may be impacted due to their negligence.

Now I believe this is contrary to OPG's 2010 sustainable development report mandate claiming that they operate in a safe, open and responsible manner. It is disheartening that instead of ensuring the safety of Canadians, the nuclear industry's interests seem to lie in the protection of itself. And this lack of transparency and corporate irresponsibility is precisely why the public distrust towards OPG's proposal exists.

Now unlike my above concerns, what is probable and my next concern is related to a practice that happens today and sadly is accepted as a norm in the nuclear industry, the fact that the nuclear industry is allowed to kill tens of millions of fish a year is absurd. Moreover, the result of killing tens of millions of fish has gone completely against our federal *Fisheries Act*.

To reiterate as per our *Fisheries Act*, Canadian fisheries waters means:

> "All waters in fishing zones of Canada, all waters in the territorial sea of Canada and all internal waters

of Canada."

Obstruction means:

"Any slide, dam or other obstruction impeding the free passage of fish."

In Section 34(b):

"Any water that contains a substance in such quantity or concentration or that has been so treated, processed or changed by heat or other means from a natural state that would, if added to any other water, degrade, alter or form part of a process or degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered, deleterious to fish or fish habitat or to the use of man of fish that frequent that water."

And lastly deposit means:

"Any discharging, spraying, releasing, spilling, leaking, seeping, pouring, emitting, emptying, throwing, dumping or placing."

It is alarming that here we are in 2012 with alternative options available to us to produce energy and yet still continue to operate an outdated system such

as the once-through cooling system. As mentioned earlier, I'm no expert but it does not take a scientist to recognize the negative impacts to our water system resulting from the exorbitant number of fish, larvae, eggs, small fish that are the foundation of the food chain, not to mention endangered species such as the American eel and round white fish that reportedly can be killed in 15 seconds in a body of water the size of an Olympic pool.

How is this considered okay? In relation to the overall scope of the project perhaps it is of little concern to the executives at OPG and CNSC. But I believe it's wrong, extremely selfish and is the epitome of the old-school take, make, waste mindset.

My personal opinion overall with OPG's proposed plan in place to refurbish the Darlington nuclear power plant is comparable to our government's decision to withdraw from the Kyoto Agreement in 2011. I believe it is a backwards movement that does not follow suit with what the some of the forward thinking nations such as Switzerland, Belgium, Germany and now Japan have begun to do with true sustainable energy. We have a lot to learn from these nations.

In ending, I can appreciate the invested interest of our government and OPG's decision in the

reconstruction of their reactors. And I sincerely hope to witness the fruition of a cohesive relationship between the general public, OPG and CNSC. However at this time, I do not feel your points are credible. I think reconstruction vulnerabilities are unacceptable. I do not agree with your rules nor do I trust the modelling system used. Bottom line: I believe your standards are not good enough.

I would like to remind OPG of what is stipulated in their 2010 sustainable report: public trust is our oxygen, without it we can’t operate nor would we deserve to. I am here as one person out of many in the public that does not trust OPG’s proposed plan. So I will end my presentation today with three asks. And I’ll echo what was mentioned previously I’m sure in the last few days.

Because I do not trust your assessment and given the historical international large-scale accident, I would like OPG to provide the public with a detailed assessment of a large-scale accident should one occur in Darlington, such as a nuclear explosion or a terrorist attack.

Two, I do not believe it is right for OPG to kill fish and pollute water by the once-through cooling system. Should this reconstruction continue, I would like

OPG to invest in a cooling tower versus continue the use of an outdated once-through cooling system.

And three, would OPG be willing to operate the refurbishment if the federal government remove their cap on liability or in other words, without the *Nuclear Liability Act*?

Thank you.

THE CHAIRMAN: Thank you.

Monsieur Tolgyesi?

MEMBER TOLGYESI: I'll address my question to OPG and to staff. On page two of the presentation, there's: "The Darlington reactors share one containment system between four reactors." And "Even with separate containment systems, it did not avoid the release of radioactive materials in Fukushima."

So several intervenors expressed concerns regarding this multi-reactor safety support share between several reactors as opposed to one reactor and one safety system. Could you comment this statement?

MR. TREMBLAY: Thank you. Pierre Tremblay, for the record.

I'm going to ask Brian Duncan, the site Vice President for Darlington, to talk about the safety features and the points that are raised. Thank you.

MR. DUNCAN: Brian Duncan, for the record.

So essentially Darlington is comprised of four independent units. Each unit has its own control systems, it’s got its own computers, it’s got its own control panel. And heck, even my operations staff are divided separately up among the units.

Each of those units has two completely separate and independent fast-acting shutdown systems. Either system is capable of quickly shutting down the reactor if required.

In fact each shutdown system uses completely separate devices to monitor and look for issues on the reactor. So the devices that look at power, temperature flow are completely separate. And we go even further with our design in that the shutdown systems themselves are physically located in separate areas of the plant so that a problem with one shutdown system couldn’t affect the other.

Each reactor is housed in a thick concrete and steel-line containment structure that protects my workers and protects the public.

It’s true, we do take advantage though of having all those units close together. We share some systems to improve safety and reliability. So we share a control room. We share a fuel handling system and we share a vacuum building, a vacuum building a design which

gives us a significant advantage following an accident over plants that don't have this feature. A shared containment gives us more margin for a single unit event, but it's designed for multiple unit transients as well.

Our analysis shows that the design is robust and it's safe. However, as we've discussed in the preceding couple of days, we're looking at opportunities to provide even more margin for more extreme events. So we're looking at things like a new containment venting system, which will be installed before we execute the refurbishment and that's an example where we can improve further upon the design we have.

I guess I'd say finally for events that we can't predict, our post Fukushima mobile equipment, for example, allows us to provide essential water and essential power to any or all of the units.

THE CHAIRMAN: Thank you. Another question, please. Mr. Harvey.

MEMBER HARVEY: Maybe the staff ---

THE CHAIRMAN: I think we discussed it yesterday in depth. I don't think we can revisit this over and over. So is there another question? Is DFO still here? Go ahead, Dr. McDill.

MEMBER McDILL: Again because all intervenors are here all the time, I wonder if I could ask

DFO to comment on this intervenor's concern with respect to fish, although I think you've been here all the time.

THE CHAIRMAN: That's the intervenor, were you here for the last two days?

MS. BALUYUT: Yes, I have been.

THE CHAIRMAN: Okay, thank you. DFO.

MR. HOGGARTH: For the record, Tom Hoggarth from Fisheries and Oceans.

And the intervenor discusses and speaks to the number of fish that are impinged and entrained at the facility and I'd just like to add that Fisheries and Oceans, as well, was concerned with this and therefore have continued on with an analysis of it. We have made the decision through our review that the loss of fish from the impingement and entrainment at this facility would not be considered significant on the populations of Lake Ontario.

However, we didn't just stop there. In our discussions with Ontario Power Generation, they have indicated their intent to apply for a *Fisheries Act* authorization and through this authorization process, we will work with them to offset this loss.

So although at this point of time in our review, the assessment is that if there is a loss, it's a residual loss and not likely significant. We will move

forward with the -- offsetting this, such that through to the future this loss again will not be a residual impact.

And we're working with them right now on the development of habitat and improvements to or modifying the graded habitat and/or improving or creating new habitat. And for us, the legacy of this is even after the project closes down in the future, this habitat will still be available and producing fish.

THE CHAIRMAN: Thank you. Mr. Harvey.

MEMBER HARVEY: It's mostly a comment to Ms. Baluyut.

You said you have been here since the beginning and most of the points you brought in front of the Commission have received response since that time and the essence of your message is you don't trust, you don't trust us at all, you don't trust CNSC staff, you don't trust OPG and you probably will not trust any decision that we –- so we've got to work with that with experts, with specialists. So who will you trust?

MS. BALUYUT: I guess if I can comment. Over the past couple of days I've heard CNSC and OPG reiterate, you know, assessment-based conclusions based on whatever item or topic was brought to light. And I've heard a lot of responses such as concentrations are minimal or impacts are not significant or below threshold,

et cetera, and therefore, it's considered satisfactory.

With all due respect, I beg to differ. Minimal or not, I'm not satisfied with any number of fish being killed unnaturally or low levels of toxic chemicals released into our environment and at any given time, I'm certainly not satisfied with even a small probability of a nuclear explosion. I believe that this type of negligence is irresponsible and consequences that are there are irreversible. So bottom line, just because in my opinion it meets standards, does not make it right.

THE CHAIRMAN: No, but isn't it true it doesn't matter what, you're just anti-nuclear. Forget about, you're just anti-nuclear. I'd like, but she did mention explosion. Like explosion is something that I have never heard anybody else say, that's new. Can anybody talk about the probability of explosion? Let's start with OPG and then staff.

MR. TREMBLAY*:* Pierre Tremblay, for the record.

I'm going to ask Mark Elliott, our chief engineer to comment on that.

MR. ELLIOTT: For the record, Mark Elliott.

You know, in the past for many years we've had the question about a nuclear explosion and our reactors cannot blow up in a nuclear type explosion. I

think that’s well known.

I think what’s been talked about more recently on explosions is hydrogen explosions and the safety of our plants takes into account that in severe accidents you could get hydrogen produced and that’s why we have several means to avoid the hydrogen being produced in the first place by keeping the fuel cool with all our safety systems and our emergency mitigating equipment.

But also we have hydrogen igniters that will basically turn the hydrogen into water and eliminate the risk of a hydrogen explosion. And more recently, we’ve put in these passive autocatalytic recombiners. These are passive devices that are being installed and will be all installed by 2014 that would recombine the hydrogen and eliminate the possibility of an explosion.

THE CHAIRMAN: Staff.

MR. WEBSTER: Thank you, Mr. President.

It’s Phil Webster, for the record, the Darlington director.

I can add very little to what Mr. Elliott just said. It is physically impossible to have a nuclear explosion with any reactor that uses natural uranium or even low enriched uranium. Hydrogen is mitigated by the existing igniters and that mitigation is being improved by the installation of what are called passive autocatalytic

recombiners that will reduce the possibility of a hydrogen explosion after even a severe accident to nil.

These devices were installed this year in unit three at Darlington and it will be complete across all OPG stations by 2014.

THE CHAIRMAN: Thank you. Any other question?

Just I think it's a good time now to bring NRCan because we've been hearing now about the *Liability Act* quite a bit. I think it's time to get some clarity from the department who is responsible for the *Liability Act*, maybe to try to put some context and explanation as to what's the future of that Act.

MR. McCAULEY: Good morning, President Binder, fellow Commissioners.

My name is Dave McCauley. I work at Natural Resources Canada.

Yes, I'm happy to provide you with some background on the *Nuclear Liability Act* and our current process to make improvements to that legislation.

One thing that I think is very important to establish is the purpose of the legislation. The purpose of the legislation is to clarify the liability and compensation regime in the event of a nuclear accident.

So what it does is it establishes that the

operator, in this case Ontario Power Generation, is absolutely liable for any damages associated with the accident. And in that regard, absolute liability means that there are no common defences that might be available to other industries in the event of damages caused by an incident that they might be responsible for. So it makes the operators absolutely liable. It also channels all liability to the operator so that suppliers and contractors themselves are not liable, but rather all the liability is channelled to the operator, and that is so that all of the insurance can also be channelled to the operator because we're operating in a situation where the capacity -- the insurance capacity is fixed and so the insurance industry has taken it upon themselves to only insure one entity and that is the operator.

I saw in some of the interventions there was a comment that people can't get insurance for their homes against nuclear liability. That's because all of the insurance is channelled to the nuclear operator.

And then the legislation also requires that there -- that the operators hold financial security for the damages that could be caused as a result of the nuclear accident, and that -- and so they have to go out and actually get the insurance from an approved insurer that's approved by the federal government. But that

liability is fixed in the legislation and limited. And we've heard often that it's limited at $75 million and various intervenors have commented on the inadequacy of that and certainly our legislation has not kept up with the liability limits in other countries.

And so we have underway a review of the legislation. We have actually brought before Parliament four times, now the current government, drafts of a bill to improve the legislation and due to the prorogation or the dissolution of Parliament, we haven't been able to -- they haven't passed through the Parliamentary process. So we are currently preparing more recommendations for the consideration of Ministers in the not too distant future.

THE CHAIRMAN: Thank you.

Ms. Velshi?

MEMBER VELSHI: So with this revised legislation where you're contemplating increasing the limit from 75 million to whatever the new amount is, is the new amount based on assessment of what the true costs would be in the event of an emergency, in the event of an accident?

MR. McCAULEY: Dave McCauley, for the record.

That's a consideration but it isn't really the factor that sets the liability amount. More critical

is probably the capacity of or the availability of insurance capacity for the operators to obtain. I mean, there aren't -- there isn't unlimited amounts of insurance capacity for them to purchase and secondly, another consideration that we look at is, well, what is the international standard in terms of liabilities? What are other countries doing? And then you know, once we establish the limit or consider the limit, then we look at, okay, in the event of an incident, what is the likelihood of damages, et cetera, and how does that relate to what limit we might be establishing. But I wouldn't want to say that the consideration of the consequences of an incident is what establishes a limit; there are other factors that are more relevant.

MEMBER VELSHI: One of the concerns that we've heard repeatedly over the last few days is that the nuclear industry is subsidized by the taxpayers because the operator is not paying for the full cost or the insurance associated with that. So it's an important consideration and it would be insightful to know how much insurance really is -- what fraction of the anticipated cost do we expect the liability cap to be.

MR. McCAULEY: I'm not certain that I understand the question but let me say that in the previous version of the bill that went forward to

Parliament, the liability limit that was suggested was $650 million, which would be a significant increase in the insurance that the operators would have to -- would have to purchase. And I'm not too sure what they paid for their insurance but it would be a significant increase.

MEMBER VELSHI: Yeah, I'm sorry; it wasn't so much the insurance premium. I think what we'd heard was something, the Fukushima incident caused I don't know how many billions and billions of dollars and any cap would just be a drop in the bucket compared to what the true cost would be, in the event of an incident.

MR. McCAULEY: So I mentioned previously that in terms of a catastrophic incident, I don't think it would be appropriate to establish a liability limit at what might be contemplated to be a catastrophic incident. In terms of the legislation that had -- currently the situation is under the *Nuclear Liability Act* that the limit is $75 million. Under the legislation that had been brought forward to Parliament previously, the proposed limit had been $650 million but there had been a proposal that government, in the event of an incident, the Minister would bring forward to Parliament a report on the incident and the anticipated costs of that incident.

THE CHAIRMAN: Okay, we're going to move -- you're going to be with us the rest of the day.

MR. McCAULEY: Yes.

THE CHAIRMAN: I think you will be called to the table quite a few times.

MR. McCAULEY: Okay.

THE CHAIRMAN: A different subject. And the intervenor, you have the last word.

MS. BALUYUT: I've pretty much said everything I need to say. I appreciate your time.

Thank you.

THE CHAIRMAN: Thank you. Thank you very much.

MR. LEBLANC: So the next submission was to be an oral presentation from Ms. Jennifer Deguire. She is not available and asked that her submission be considered as a written submission later on. So we'll proceed with the next submission.

THE CHAIRMAN: The next submission is an oral presentation by Mr. O'Toole as outlined in CMD 12-H13.103.

Mr. O'Toole, the floor is yours.

12-H13.103

Oral Presentation by

John O'Toole

MR. O'TOOLE: Good morning, Mr. Chair. My name is John O'Toole, I'm the MPP, Member of Provincial Parliament for the riding of Durham, and I recognize that the CNSC is here this morning dealing with really three issues: The environmental assessment of the Ontario Power Generation proposed refurbishment and continued operation of Darlington Nuclear Generating Station; the application by OPG to renew the Darlington Waste Management Facility licence, the waste management operating licence, WMOL; and the application by OPG to renew the Nuclear Power Reactor Operator Licence for the Darlington Nuclear Station until December 21st, 2014, referred to as the PROL.

General observations in favour of the refurbishment and licensing application: As a member of provincial Parliament for the Riding of Durham, I endorse the refurbishment and continued operation of the Darlington Nuclear Generating Station, as well as both licensing applications.

In my view, many of the facts in support of the refurbishment and re-licensing are the same. I would like to briefly highlight my reason for supporting these activities.

First, I'd like to point out, and on the record, the Darlington operation award of excellence received just recently in November 2012 for safety

operation and management. Furthermore, 12.7 million hours with no lost-time accidents is a pretty significant achievement.

Having served as the MPP since 1995, and previously elected as a municipal and regional councillor, I am confident in the observations that the Darlington Nuclear Generating Station and its related operations have a strong community support.

Although onsite waste management is admittedly a short-term solution, it has been generally understood and accepted in the community, and they understand, as I do, this is part of the implementation of the adaptive phase management with the ultimate solution of deep geological storage, in a willing host community. The Clarington community, and indeed the Region of Durham, looks forward to the estimated 6,000 direct and indirect jobs that the refurbishment project will create. The spin-off benefits will be of value to Durham Region and indeed to the Province of Ontario, perhaps Canada as well.

Refurbishment of the Darlington Nuclear Generating Station will continue to provide safe, clean, and carbon-free reliable base load for electricity for the next 25 to 30 years. It is important to the economy and to Ontario’s energy infrastructure. I think it’s the only real choice in the short term.

I support green energy and recognize the importance of new energy innovation in the years ahead and that being said, the provincial government's current *Green Energy Act* and related policies have demonstrated the importance of safe, reliable, and affordable carbon-free base load.

Just a bit of an aside, the price per kilowatt hour of solar power under the FIT contracts is about 82 cents a kilowatt hour. Factors such as the FIT contracts and the global adjustment resulting from that, have caused power prices to double. We're the highest in North America. In this context, consumers understand the values of Ontario's nuclear fleet. The refurbishment of the fleet will ensure that nuclear base load will continue to represent an important power supply for the Province of Ontario, 50 percent.

Darlington Nuclear Generation Station is important as a generator of 20 percent of Ontario's electricity, that's 13.8 Terawatts of electricity in the second quarter alone. In my riding of Durham, Darlington's important focus for the future opportunities of energy -- in the whole energy sector.

The future potential has been recognized with the creation of the Clarington Energy Business Park. Indeed the 2,500 or 250,000 square foot multi-purpose

Darlington Energy Complex is already underway due to be completed in 2013. This will house a public information centre, security processing, training, and a centre and a tooling and testing facility.

This world class training facility at the energy park is an important part of the strategic plan for nuclear power, indeed power, in the Province of Ontario, perhaps available as a service around the world. The potential exists for the Darlington Nuclear Generating Station to be a catalyst for innovation, education and entrepreneurship, as we heard from the students here this morning. And this will address our needs for energy and innovation in the future.

Our close connection with the auto sector will enable energy research and the development of the fuels of the future. The industry's association with Durham College and the University of Ontario Institute of Technology, UOIT, will help to build a strong skilled workforce as well as encourage innovation. OPG has invested $5 million over five years for program curriculum and expansion in research, commercialization, scholarships and bursaries at UOIT and the College.

Darlington's potential as a catalyst for future ventures can be seen in the formation of the Durham Strategic Energy Alliance, DSEA, which is a partnership of

approximately 50 leaders in the local energy sector and Durham is the energy hub of Ontario.

Having more than two decades experience in operating the Darlington Nuclear Generating Station, Ontario Power Generation has established a trusted relationship and a proven track record for demonstrating the safety of the plant, as well as a comprehensive monitoring program that would address potentially adverse conditions. OPG has an excellent communication record with the public.

I agree that the past two decades have shown that Darlington operates with a small environment footprint and minimal impact on the environment generally. OPG makes every effort to keep elected officials like myself informed, and is quick to open up the lines of communication with phone calls, emails, and direct calls as needs arise. Members and staff that I deal with as an elected MPP are knowledgeable and well qualified.

They keep us informed on the issues, such as emergency preparedness, safety drills, the status of Darlington units, community concerns. This information is effectively published and communicated to the wider community. The company communicates with residents through the Darlington Nuclear Neighbourhood magazine, the OPG community kiosk in the mall, and has helped to inform

resident on plans for the future, including this Darlington refurbishment, the nuclear new build, as well as the waste management facility.

Three communities, including Darlington Nuclear Heath communities, Darlington Community Advisory Committee and the Pickering Community Advisory Council provide feedback to OPG as well as the community. I have always found senior management to be available, informative, and willing to keep elected officials informed. I have indeed toured most of the nuclear facilities not just in Durham but within Ontario.

Considerations of the future. An energy issue becomes more technically -- as they become more technically complex, we must always ensure there is clear communication with the citizens, and I commend these hearings in the area that the nuclear plant exists. There must be -- continue to be consolidation or consultations with citizens and the community. This participation should be built into future planning and implementation of projects at any nuclear facility.

We need to maximize economic benefits of this process through policies that make every effort to buy goods and services locally and to indeed, hire locally. For an example, the University and the College are training the very engineers of the future. This area

is indeed a centre of excellence for energy.

There must continue to be open, transparent, and real costing of all forms of energy production. That's an important policy issue that there's no indirect subsidies across any of the new energy solutions.

My own question as well, is the decision recently to close the Pickering Nuclear Generating station in the future. This is an important asset that would otherwise be stranded. And I'd also like to point out at -- locally there's a Wesleyville plant that was originally a fossil plant that -- 1,600 acres I believe, that's just complete asset that's underutilized. This is part of the accountability that needs to be more open to the public.

In conclusion, I continue to support the Darlington Nuclear Generating Station refurbishment project and relicensing application, as well as the licensing of the Darlington Waste Management Facility. I will continue to advocate with the Province of Ontario, on behalf of the refurbishment at Darlington. I look forward to working with all stakeholders to ensure this project is successfully completed, on time and on budget.

Thank you for your time this morning.

THE CHAIRMAN: Thank you.

Thank you very much.

Questions?

Let me ask you, sir, you’ve been hearing -- I don’t know if -- how long you’ve been ---

MR. O’TOOLE: This morning.

THE CHAIRMAN: This morning. So you’ve been hearing again, some -- not everybody’s on side. So I’m just wondering whether you get a lot of representation in your riding work from all sides?

MR. O’TOOLE: Yes, thank you very much for the question, Mr. Chair. I do think it’s important that I remain informed and engaged and open to the input and comments by people.

I have served as the energy critic in the Province of Ontario. I have served on every committee of the Ontario Legislature over the last 17 years, dealing with energy including the nuclear process of looking at the restructuring of the old Ontario Hydro. And in that case, it is my responsibility to remain informed.

In fact, demonstrating that this morning by presenting to you, and I generally refer them to the experts, and not to put them off. Because even listening this morning to the response from the OPG staff, as well as your staff itself, I find the integrity is there and the desire to have accurate and informed answers is there.

My job, directly, is to know the people

that have the power and the authority to make decisions. That's really my role as a local member serving for 17 years.

THE CHAIRMAN: I was just reacting that you -- a lot of people are saying that the community has a strong support. I just want to know where there is any numerical evidence. Is there any survey, is there any -- or is it your kind of sense of the community?

MR. O'TOOLE: Well, it's a very good question. I would say with all objectivity in mind, we are a willing host community and have been quite well served by OPG in every aspect of its integration to the community. The people that work there live here and I think that's a testament to the acceptance. They're the very hockey coaches and teachers in our community, they're families that recognize that all forms of energy have a certain amount of risk; whether it's a reservoir for hydro-electric or whether it's some of the new forms of energy that are perhaps not as reliable or dispatchable.

And I believe the university is a testimony to that. It was built, it's support for the future of our youth, for jobs and the economy, and as the American President once said, that if you get the energy policy right, you get the economy right. And I think we are.

Certainly there are people that want to

question and I encourage that. I encourage good, solid, meaningful dialogue that includes scrutiny of this type of hearing here today.

THE CHAIRMAN: Thank you for taking the time.

Thank you for the presentation.

MR. O'TOOLE: Thank you very much committee.

Thank you.

THE CHAIRMAN: I think it's a good time for us to take a break for about 15 minutes. So that will take us to five past 11:05. Thank you.

--- Upon recessing at 10:47 a.m.

L'audience est suspendue à 10h47

--- Upon resuming at 11:02 a.m.

L'audience est reprise à 11h02

THE CHAIRMAN: Okay. We are ready to continue. And the next submission is an oral presentation from Ms. Moudrak, as outlined in CMD H13.104 and 13.104A.

Ms. Moudrak, the floor is yours.

12-H13.104 / 12-H13.104A

Oral presentation by

Marina Moudrak

MS. MOUDRAK: Thank you. Good morning, ladies and gentlemen.

My name is Marina Moudrak. I'm the President and CEO of Penetrate Business Solutions, a Canadian company which offers information technology and electrical engineering consulting service worldwide.

MR. LEBLANC: Madame Moudrak, could you be closer to the mic? Your voice is not carrying.

MS. MOUDRAK: Thank you very much.

MR. LEBLANC: Thank you.

MS. MOUDRAK: Is it better?

MR. LEBLANC: I will ask Louise to assist you.

MS. MOUDRAK: Thank you. Should I repeat the introduction?

So my name is Marina Moudrak. I am the President and CEO of Penetrate Business Solutions, a Canadian company which offers information technology and electrical engineering consulting service worldwide.

However, today I am not here as a company representative. I am here to present you with my personal views as a concerned Canadian citizen. Thank you for providing me with this opportunity.

There are mainly two questions that I would consider with you today.

First, what challenges does the future pose to us if we proceed with the proposed refurbishment and continued operation of Darlington Nuclear Generation Station?

And when I was working on my presentation, I was thinking of discussing at the risk of cyber attacks on nuclear facilities because it’s my speciality. I’ve been working for 35 years in this area. But hearing all of the other presentations, I understood that it’s highly difficult area of discussion and probably it would be difficult to understand the real aspects of this difficult question. That’s why I would like to discuss the other questions.

Question: Why are the proponents of the Darlington expansion presenting the vision of our future and the future of our children and grandchildren as something very prosperous and desirable for all of us?

The answer to this first question is a better known technique of creating an image of desirable future.

From the very be -- from the very arrival of nuclear energy, the image of readily available and inexhaustible energy sources has been used for the case.

Presenting the public with this future of free energy worked well. The proponents of nuclear energy promised that nuclear fusion would lead us into a blissful future of cheap and clean source of energy with no harmful environment effects. Do not give this vision to the public.

In 1957, a Walt Disney aired a cartoon called “Our Friend, the Atom”. The film, along with a companion book, was produced in cooperation with U.S. Navy and General Dynamics, the builders of the nuclear submarines. Through the preparation of General Dynamics, the U.S. Government and Walt Disney helped shape the vision of nuclear energy as something fun and safe. These sellers of rosy futures knew that product or idea sells best by directly associating with the desirable future or dream world.

The title of Mr. Eisenhower address to the United Union -- United Nations, sorry -- Atoms for Peace, sounded almost like the name of the Walt Disney cartoon -- echoed the name of the first nuclear power station in the world, Peaceful atom, connected to the power grid in 1954 in the USSR. This was not a coincidence. While promoting the notion of a peaceful atom, both the U.S. and the USSR were developing expansive nuclear weapons program using commercial power reactors to produce weapon grade

plutonium.

Eventually, as the history illustrates, instead of the promised future of peace, prosperity and happiness, a vast amount of nuclear weapons was created, and the long list of countries possessing weapons of mass destruction.

At the same time, a Peaceful Atom Program turned out to be an enormous business success for Walt Disney catapulting the company out of financial difficulties and turning it into a media giant.

The U.S. Navy have all the General Dynamics billions of dollars for nuclear submarine services. And General Atomics, founded in 1955 as a division of General Dynamics, became a key defence contractor in the U.S.A.

Canada too, has also benefited from the notion of the peaceful atom, selling uranium for use in American and British nuclear weapons programs. Under the agreement for cooperation between the Government of Canada and the Government of the U.S.A., signed in ’55, approximately 252 kilograms of plutonium in spent reactor fuel from Chalk River Facility was sent to the United States Nuclear Weapons Program. Source: United States Department of Energy, 1995, for reference.

Fat Man Bomb that was detonated over Nagasaki. Around 7.2 kilogram of plutonium was used. So

you could make calculations of how many atomic bombs were created from Canadian Peaceful Atom Program.

The USSR and the U.S.A. were competing not only in the military race. The scientists of both countries were researching the possibility of thorium for electricity production which was more efficient and environmentally friendly than uranium. It cannot be used for military applications making a truly Peaceful Atom. Despite the success in the U.S., the Oak Ridge National Laboratory Program was closed down in the early 1970s in favour of weapons friendly uranium.

In the USSR, the founding of the program was reduced severely because of the extensive funding of military programs.

The Chernobyl disaster seriously damaged the promised rosy future of the Peace Atom. It could have happened only in communist country, they had been told. And bright promises of economic and technological growth were once again being sold to the public. And the public was buying them once again until last year when the Fukushima disaster has once again caused many citizens of the nations across the globe to reconsider nuclear energy.

While some say the Fukushima disaster was caused by natural disaster, Mr. Kiyoshi Kurokawa, the Chairman on Fukushima Nuclear Accident Independent

Investigation Commission testified that, I quote, “It was a profoundly a manmade disaster that could and should have been foreseen and prevented.” So has nothing changed since 1950s?

On the sides of nuclear industry and government leaders in their speeches, presentations and during these hearings, we continue to hear the promises of clear air, clear water, cheap energy, economic benefits and prosperity.

During the hearings and during the hearings which were last year in 2011. We heard a lot of opinions of the nuclear energy and opinions of the Darlington expansion plans. There are texts, evidences; mounting debts problems; safety concern.

But it seems to me that the sellers of rosy futures and peaceful atoms prevail in public minds. Because, let’s face it, how many of us, average citizens, have the time to properly get educated on the subject matter and hear both sides of story.

It is clear to me that the provenance of nuclear expansion have much to gain so their marketing doors have been put to work to paint the world of economical growth and prosperity. This is unfortunately a much louder voice than the average citizens here. We have to learn the lessons. The favourable predictions of

economical growth and prosperity are just a tool for influencing today's decision processes.

We have to understand that by painting pretty pictures of the future world, the nuclear provenance cover present interest of financial institution and specific commercial groups such as Atomic Energy of Canada Ltd., SNC Lavalin, Cameco Corporation, to name but a few.

Let's consider the political, the economical, and technological ---

THE CHAIRMAN: Can you wind up, please?

MS. MOUDRAK: It's just one word.

THE CHAIRMAN: Okay. Thank you.

MS. MOUDRAK: --- realities of the present world including the modern alternative nuclear technologies. Let's not use the tricks from 1955.

So I just have only a few questions to ask the representatives of Nuclear Industries and the representatives of OPG.

THE CHAIRMAN: Well you can ask one, you know.

MS. MOUDRAK: Yes, that's if, this is only one question.

THE CHAIRMAN: We would actually like to discuss your submission on -- you may not have spoken

about cyber security but we are very much interested in cyber security.

MS. MOUDRAK: I just ---

THE CHAIRMAN: So you -- ask your question.

MS. MOUDRAK: Yes. I just printed some of the recent accidents happened ---

THE CHAIRMAN: No, we -- you are way over time.

MS. MOUDRAK: Yes.

THE CHAIRMAN: We have read your submission.

MS. MOUDRAK: Yes.

THE CHAIRMAN: So one should allow us to ask questions.

MS. MOUDRAK: Yes. Of course.

THE CHAIRMAN: Okay.

MS. MOUDRAK: But I think it’s enough. The public could read the recent evidence of the security breach at nuclear facilities.

THE CHAIRMAN: Okay.

MS. MOUDRAK: And just proceed.

THE CHAIRMAN: Who wants to go?

Well let me start then.

Okay. Cyber security, I wish you were talking about cyber security. We are all aware of the

history of the nuclear evolution.

But let me start with cyber security. I'd like -- this is a very hot topic everywhere; not only nuclear, in governments, in industry. So what is the OPG doing about it and what are staff doing it and maybe what internationally is being done about this?

MR. TREMBLAY: Pierre Tremblay, for the record.

I'm going to ask Mark Elliot, our chief engineer, to talk about that. I guess the one context I would make is that there has been, and the Commission knows this since the events of 9/11, a lot of work done in the area of safely securing our nuclear facilities and that includes both the very visible presence of a nuclear security force as well as the less visible aspects of intelligence and security. So I'll ask Mark Elliot to talk specifically about that subject. Mark.

MR. ELLIOTT: Mark Elliot, for the record.

At OPG we take the cyber security threat very seriously. And we have a rigorous process for both the software quality assurance that the intervener brought up and cyber security. And those processes meet industry standards which I'll discuss.

I want to just correct one thing that doesn't apply to Darlington that I saw in the intervenor's

submission that there was a complex network that could be intertwined. In fact Darlington has a different system that's separate. Not a network. We have a reactor regulating system that's separate from a shut-down system number 1, that's separate from a shut-down system number 2. So, so there's not that complex network.

And it does tie in to cyber security because those systems are all unique to Darlington and so it's not out there with software that's available that people can understand and then could try to attack. It's unique software, maintained by OPG. And it's separate and there's not that network.

On cyber security, we adhere to two different standards that are in play right now. The North American Electricity Reliability Council, the NERC has eight standards that have been -- that have been implemented and OPG is in compliance with those eight standards.

Really what it means is that our real time software, the software that monitors and controls the plant is physically separate and has barriers between its operation and in our local area network, kind of our business system. And our business system has barriers separating it from the outside world. So there's barriers to prevent any possible impact on the software or the

computers that are actually running the plant or providing operations some monitoring. So those barriers are in place.

The other more recent standard is a Canadian Federal Standard the industrial control system security best practice guide. It was issued in September of this year. And we're in compliance with that guidance as well. That -- I'll leave it there for the moment.

THE CHAIRMAN: Staff?

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

Just to confirm that the separation of the external and the operation of the -- the safe operation of the reactors are separate. I will pass it on to Mr. Gerry Frappier to provide the details with respect to national/international activity.

MR. FRAPPIER: Thank you. Gerry Frappier, Director General of Assessment and Analyses.

So there is an awful of lot of work that has been done on cyber security with respect to nuclear facilities and infra-structure and that is continuing to be done.

I think the first thing to, for people to put in their heads is that as OPG was just mentioning, there's a big difference between what I would call

business systems, if you like, that control the businesses and they're connected in certain different ways and safety systems, the instrumentation and controls that actually control the nuclear power plant. So it's very important to realize that those are completely different worlds at Darlington.

And the cyber attacks that you might be used to in the common literature and what not are tend to be geared more towards the what I would call business systems and the what not. Although there are certainly some that attack instrumentation and control systems. But they are much, much more sophisticated and less likely to be around.

So as was mentioned, we have requirements for the licensee to have cyber security programs. We've reviewed the programs that they have in place and as was mentioned, there are good architectural structures that are in place to reduce cyber security. There is also active programs to, as I was mentioning, software quality assurance and review of communications and firewalls and all that.

I think that it's also important and I think that people realize, cyber security is a very dynamic area. There is a lot of things that are happening. Lots of new things are coming out. Both that

you hear about and some that you don't hear about.

The CNSC is very well-connected with other government departments of the federal government that have security responsibilities and in particular the communication security establishment that has primary role with respect to any cyber threat to the government systems and to the country as a whole. So we are in regular discussions with them with respect to threat analysis. What sort of things we can be expecting and what we could be, what we should be doing to protect ourselves.

Also internationally both from the IAEA perspective and from other regulators, we have several working groups that are on the go that to look at again both what is happening on the threat side but more importantly or more practically what are the best practices and therefore influence the standards. Because this is something that is going to continue to evolve over the years.

THE CHAIRMAN: The intervenor on page 4 and 5 of her written submission gives some examples that are pretty scary examples. Right.

One is as late as October 24th, 2012. Two reactors shut down Dominion, Virginia, and the quote is, "It was shut down malfunction for reason unknown." I assume the intervenors are connecting this to a cyber

attack and even more scary is the IBM, the next page, the IBM internet security system that actually hacked into a system. Well what would you say about that? And maybe OPG can.

MR. FRAPPIER: For the details, I'd like to go back to Ottawa if I could, they're on the phone, I know there's a little bit of a delay but they'll be able to give us some details on specific events.

And I'm not sure Ram if you can hear me okay?

MR. KAMESWARAN: This is Ram Kameswaran (technical difficulties). I am here and I can hear you. Can you hear me?

THE CHAIRMAN: Yes we can. Go ahead.

Hello, go ahead.

MR. KAMESWARAN: Specific examples that the intervenor has given about the Dominion of Virginia Power first was (technical difficulties) but we do not know whether this was a deal with cyber attack and I think the media reports a little just to the cyber attack but the back that we have we do not know whether it's the trivial cyber attack. (Technical difficulties) very specific to model to (technical difficulties) controller. Again that's OPG (technical difficulties).

THE CHAIRMAN: Stop, stop him. We can't

understand you, the connection is a technology here maybe somebody is hacking into our telecommunication networks. But your not coming across; we can't hear you. We can't understand you.

MR. KAMESWARAN: Maybe I'll try to talk a little bit slower and if you can hear me please let me know. Is this okay?

THE CHAIRMAN: Yeah, slower is better.

MR. KAMESWARAN: Okay the ---

THE CHAIRMAN: Okay I guess what –- I guess what you guys should get an email explanation and maybe somebody should transmit a bit later on.

In the meantime OPG?

MR. ELLIOT: Mark Elliot, for the record.

The –- just the first event I'll talk about and then turn it over to Dietmar Reiner for more specific answers. But when I said that the computers for real time for controlling and monitoring the reactor are physically separate, the engineers do have to have access to those to update and maintain those systems. And our engineers are trained to avoid the kind of things that happen here in the intervenor's page 4 at the top.

So that kind of thing is well known to us and the engineers are aware and trained not to put any kind of software that's from the outside onto the real

time processes. And so we don't believe that would happen in OPG, I'll turn it over to Dietmar Reiner for some more information.

MR. REINER: Dietmar Reiner, for the record.

This was one of my prior areas of accountability in the company. So in addition to what you hear about software quality assurance and firewalls, and firewall rules, we also conduct testing that makes use of ethical hacking I'll call it. There are firms our there that will do that sort of thing and what that involves is these entities try to access your IT systems, your networks and see how deep they can get.

And what that process involves is we, behind the scenes, sort of peel back layers of security to see where penetration from the hackers can actually occur and how far back the defences have to diminish in order to allow for entry. And then we use that to strengthen the systems to establish hardware standards and additional rules. And what I can say is even in these tests, we have never been hacked.

THE CHAIRMAN: Okay.

I think the intervenor has the last word here.

MS. MOUDRAK: Yes. I just want to remind

you all the recent Canadian Spy accident. He was working in highly security network, it was well protected; it was highly security network; highly secured system. Still he was able to copy the information and there is no protection from this kind of attack to any kind of information system.

And since the nuclear industry has more and more rely on digital technologies on computer or computer-based components for controlling the facilities, of course it’s well known that there are separated systems. It was separated system for 30 years already. Still within this 30 years the systems were experience some unexpected or unknown reasons of automatic shutdown and so fourth.

So there are evidences that not only nuclear industries are working on virtual reality of nuclear pawns. There are huge groups, both funded or working on the virtual reality of nuclear plants as well, discovering that new ways of attacks to these facilities.

And I think its well known fact and as I said, we are discussing the software components over the nuclear facility systems well designed many years ago. And not only these specialists are working on this system, the well known that many Canadian specialists left the country and they are working in China, in Iran, in many other countries.

And you know we have the evidence of some unexpected as I've shown on my presentation type of viruses attacking the system. And we do not know what groups are behind all these sophisticated attacks. And it's not only nuclear facilities, there are attacks on other facilities, on water treatment plants, on energy grids, and so and so fourth.

So we are in a war already and I think that current depends in that strategies used for nuclear facilities needed to be updated and we the public will be paying the bill of this updates. And we are speaking about million and billion of dollars because we know the cost of the updating of this system is huge.

So I think that the problem of the cyber attacks on nuclear -- other facilities lies not only on people working outside trying to breach this system but problems with people working inside the system. There are contractors working in nuclear facilities because let's face it, they're working and living in time on financial crisis and companies are cutting severely the budget of IT development, or IT groups working inside the facilities. And universities know there are in the same shoes, they are cutting their budget because we are living in financial crisis right now.

And so I heard the story from my colleagues

telling me about the contracts with nuclear facilities, six three-month contracts because the facilities are not willing to spend money on IT business anymore.

THE CHAIRMAN: Okay. Thank you.

Thank you for your intervention. Thank you for your presentation.

MR. LEBLANC: We were to proceed with the submission from the Ontario Clear Air Alliance as outlined in CMD 12-H13.105. We were informed that they are no longer available and their intervention will be treated as a written submission.

So if you allow me Mr. President, we will now proceed with the oral presentation from Mr. Kalavar that was originally scheduled to be presented yesterday which is under CMD 12-H13.63.

MR. KALEVAR: And Members ---

THE CHAIRMAN: Give us a moment to find your presentation from yesterday. We’ve got to switch gear and find the book from yesterday.

MR. KALEVAR: I didn’t actually make a presentation. But, anyway, you can find what you have to find, yes.

THE CHAIRMAN: Okay, please proceed.

12-H13-63

Oral presentation by

Chaitanya Kalevar

MR. KALEVAR: Thank you very much. My name is Chaitanya Kalevar; I'm an engineer -- electrical engineer.

My first assignment -- and the previous presentation brought me to that stage of thinking. I don't like to go back but…

My first assignment after graduation was in the items for peace program in India, working with CANDU reactor. I just wanted to -- I don't want to dwell on it too much but let's get out of the way.

So in Canada my first kind of presentation, if you like, was in the '70s when the Pickering plant was in -- being built before the commission, if you recall.

And anyway, that besides, as it stands, the presentations I've heard here are as if the nuclear age is in a silo, as if nothing else affects it. Well that's actually just not true.

Yesterday we saw the temperatures were 16 and tonight they're supposed to drop to minus seven. In 36 hours we are getting a drop of so many degrees. That's almost a season being changed in 36 hours.

So we can't ignore climate change. It's

happening outside our door. If you talk of nuclear age without climate change, as I say, you are in a nuclear age silo. You better get out of it.

Climate change is coming on strong -- I'm sure you remember Sandy recently -- and the predictions of melting of ice that the sea level will rise by seven metres or so.

I would like to know if anybody has looked at the various nuclear stations and where will they go when the sea level will rise by seven metres; how many will be under water or under threat of being flooded, and all those things. I don't think that discussion has taken place.

I strongly recommend that somebody on both sides here do something about this. You can't live in a nuclear silo. That's a major point.

Okay, from what I heard yesterday, it appears some of you think you're an arms-length body from the government, but most of us think of you as in arms-lock of the government, and the government in the arms-lock of the nuclear industry.

Why would you say that? Because look at what a sweet deal the government is giving on nuclear liability to the nuclear industry. Instead of holding them responsible for billions they are getting a free ride

for millions. So again, that's something to think about.

I personally think it's time to dismantle, not refurbish any nuclear plant, let alone Darlington.

(APPLAUSE/APPLAUDISSEMENTS)

MR. KALEVAR: Yesterday somebody mentioned, I think on this side, that risk reflects not useful prediction, something to that point. And, you know, I don't think that's the point. The point is we are living on a planet; what we should be doing, as much as possible, is reduce the risk on the planet. It's about making life safer on the planet.

Every nuclear station built increases risk on the planet. Then why are we doing it? Because every nuclear station brings its own risk, as I'm sure you at least accept that.

Again, the whole issue about cooling towers, closed cycles are better than open cycles, because open cycles means you are putting the environment at danger.

Perhaps you are not aware. This is again from my experience in the '70s. I used to talk with engineers then and they were a lot open then they are now, and I actually said, "Why are you building Pickering by Lake Ontario so close to Toronto? Why don't you build it somewhere up north near some lake where you can get all

the water you want?" And one of them, in his unguarded moments, told me, "Look, if you build it there every leak will accumulate in that lake and the radiation level will keep on rising. Here it will flow away to the oceans."

Well that's what is happening everywhere on the planet. All countries are thinking that we can throw all our junk in the rivers and it will go away. Well it's going where? It's not going away. It's accumulating in the oceans.

Maybe you're not aware, but the fish count in the oceans is down. How much is it down by? I guess you won't guess it unless you heard it. It's down by 90 percent. Ninety (90) percent since then, not yesterday, since 1950 when they industry revolution in the world took off.

So don't treat fish as oh, who cares. Well, fish is the largest species on the planet, living on 70 percent of the planet, the oceans, and it lives in 97 percent of the world's water. It could be soon 99 percent as the ice melts.

So when the fish appear dead on the seashore they are reporting to us that 70 percent of the planet or 97 percent of the world's water is unliveable.

Now, if you can't hear the call of the fish, I would say stop being deaf, open up your ears and

eyes.

Recently I was in Indonesia. There was a big conference on disaster base collection. Very interesting. Perhaps you're aware, Indonesia is an archipelago where they have volcanoes, they have earthquakes, tsunamis and so forth. They have educated their society and the children on disaster risk reduction methods and how to cope with it.

Here -- of course those disasters, mind you, are natural hazards. Here we have created a disaster while building nuclear plant, but we have speaking science as if it is without any risk. Science is not without risk. The nuclear blow-ups show us that.

OPG is teaching science as if it is in a silo. It's not in a silo. It has its risk. Let's accept that. And OPG should be talking about disaster risk reduction.

Okay, I don't see any of the members from the Joint Panel review last spring when I had considerable input.

Right now the tritium is leaking from the plants and, as you're aware, tritium with water can go right into the placenta of the woman when they're pregnant and the child can be really affected and we are getting into mutants and so on.

Again, any disaster that happens, of the kind that has happened in Fukushima or Chernobyl or whatever, who is the first person at risk? Our -- the people at risk are our first responders. Who are those? They are police and the firemen. They will be asked to go and guard that contaminated site or whatever, make sure people get out and all that. Well, while they're doing that, who's looking after their families?

I made these suggestions since last year. I don't see any movement on that. I also said last year that it's not enough to have emergency plan. We have to work out the practical details. But emergency plan must be at least practised or something around those lines, you know, once in five years so that we know that we're keeping up with the traffic conditions and this and that. It has not even happened once in my 50 years around these issues in Ontario.

So there is a lot to be done but it's not happening. Natives used to say to uranium rock, it is a death rock. Right? But somehow the secular mentality is very clear; Natives have nothing to teach us; they don't know anything. Right? That is a story one of Natives once told me, which maybe if you'll permit, goes something like this:

A Native and a White man were sitting on a

shoreline and they're talking and the Native sort of said, "Oh, I just know a little bit, this much." He drew a little round circle on the sand. And then the White man got up and he drew a much bigger circle and says, "This is what the White man knows," which is all fine. The Natives didn't know how to treat with this new person who came, so he thought for a while and towards the end of the day when they're about to retire, he got up and he made a circle as big as the sand could hold. And now the White man was perplexed, he says, "Hey, you already know less than me. You accept that." He said, "What is this big circle about?" And the Native's answer, "That's what we both don't know." And it is the "don't know" aspect of our knowledge that we are really undermining.

THE CHAIRMAN: Okay, thank you. That's -- you have a summary statement, what? A conclusion?

MR. KALEVAR: Since I have had a considerable, how should I say, banging my head against the nuclear wall, I have changed from being engineer to being a poet and my poetry book will be coming out soon. If you'll allow, I'd like to read a poem for you.

THE CHAIRMAN: No, no.

MR. KALEVAR: Okay, fine.

THE CHAIRMAN: No, thank you.

MR. KALEVAR: All right.

THE CHAIRMAN: Thank you very much. Questions; anybody? Dr. McDill.

MEMBER McDILL: The intervenor has requested some additional knowledge on how the refurbishment and other things incorporate climate change. So perhaps we could ask for that from both sides. We have touched on a little bit earlier but not fully.

MS. SWAMI: Laurie Swami.

I'm going to ask John Peters to give you a more detailed analysis of the work that's been done. Climate change was something that was assessed as part of this environmental assessment, and we look at it from the models and predictions that are generally accepted, and in fact, while the intervenor talked about an increase in lake level, we've estimated and looked at it from a decrease in lake level. And John can give you more specific details if that's what you would like.

MR. PETERS: I'll just add a few points in that the scoping information document that was filed and that we complied with fully included an assessment of climate change. And Section 6.4.2 of our work summarizes, in about eight pages, the extensive research that we did in this area following up on all of the latest research on climate change, making a general assessment of the range of potential effects that may affect some aspects of the

nuclear plant; that is everything from more severe winds, more extreme rainfall events, the potential, as Laurie indicated, for water levels to raise or lower depending on what ecological system you're looking at, and all of those things were carefully considered and we did additional field research and analysis of such things as the cooling water system to make sure we understood the range of potential effects that could come and how we could adaptively manage our way forward should some of these things materialize, given what we know today and the fact that climate change is with us and it will evolve over time over the life of the facility.

Thank you.

MR. McALLISTER: Andrew McAllister, for the record; Environmental Assessment Specialist at the CNSC.

Just to build on Mr. Peters' response from Ontario Power Generation, the Canadian Environmental Assessment Agency has a guidance document on how climate change is considered in environmental assessment and that was explicitly referred to in our scoping information document that the Commission approved. And OPG's analysis followed that guidance.

As well, when looking at climate change, we certainly benefited from -- I guess the proper term, but we had a very warm winter last year which gave us a

snapshot of what future winters will be like, and it showed from a thermal effects' perspective, which has been a topic that's been discussed during these hearings, a very low and localized effect during a very warm winter. And that gives us confidence in the future of how this -- the future will perform. We do recognize that climate change is a reality and that in order to deal with that, as we've outlined in the screening report, is an adaptive management approach to dealing with climate change in the future and this is done in a consistent manner with the operational policy statement on adaptive management that the Canadian Environmental Assessment Agency has.

Thank you.

THE CHAIRMAN: Okay. You have the last word.

MR. KALEVAR: Okay, the last word.

THE CHAIRMAN: Push the button.

MR. KALEVAR: The last word if you like can be a last poem but you don't want it.

The last word would be that nuclear issues are global issues and to think of just Darlington separate from all the other 500 nuclear stations in the planet is, again, how should I say, putting blinders too narrow for the planet that we live on.

THE CHAIRMAN: Thank you.

The next submission is by the Canadian Nuclear Association as outlined in CMD H13.137 and 13.137A. And I understand that Ms. Kleb will make the presentation.

12-H13.137 / 12-H13.137A
Oral Presentation by the
Canadian Nuclear Association

MS. KLEB: Sorry, I have a bit of a cold and I don't want to get croaky in the middle of the presentation.

So good morning, President Binder, Commission Members, and members of the public.

My name is Heather Kleb and I am the acting President and CEO of the Canadian Nuclear Association. Also here with me today is John Stewart, our Director of Policy and Research.

I am pleased to be here representing the CNA membership in expressing our support of OPG's initiatives at the Darlington nuclear site. I'm delivering this message on behalf of the 60,000 Canadians whose livelihoods are directly or indirectly supported by our industry.

I'm also speaking as one of the 13.5

million Ontarians who believe that we deserve the same safe, reliable, and affordable electricity that we've had in the past. The continued service of both the Darlington Station and the Waste Management Facility are vital to providing that electricity supply.

CNA staff have read the more than 200 written intervention submitted by individuals, agencies and interest groups. All address themes that are topical and of interest to CNA members as well as the individuals and groups that submitted them.

During my presentation I will focus on three such themes. They are: the safety of nuclear facilities notably the Darlington station, sorry, the safety of nuclear facilities notably the Darlington nuclear site, the responsible management of radioactive waste and the economic benefits of nuclear power.

First and most important to our membership, nuclear power in general and nuclear power generation at the Darlington station specifically is safe. The safety of operations at the Darlington station has been demonstrated through 20 years of commercial power generation. The same pattern of safety is also true of the waste management activities on site.

OPG has owned and operated nuclear generating stations for more than four decades. During

this time it has continually improved its systems to ensure that its operations meet the highest international standards. As a result Darlington and other Canadian stations are known to be among the safest in the world. We understand that the potential for accidents and their possible consequences are important to the public's perception of nuclear power, however based on a recent risk assessment of nuclear accidents, it was determined that the risk to the public living or working near the Darlington station is very low.

This is particularly apparent when the risks are compared to other risks we are routinely exposed to such as air travel, vehicle traffic and foodborne illness. The risks of these common hazards are relatively high when compared to the record of casualties from the Canadian nuclear industry which is zero year after year for decades. And that is why we ask that safety be discussed in a factual manner and be put into context.

We also understand that public concern has been heightened by the March 2011 events at the Fukushima Nuclear Generating Station in Japan. Soon after these events Canada's nuclear industry launched a thorough assessment of our own systems and operations to confirm that they are safe. This included looking at the ability of nuclear facilities to withstand the natural disasters

that could happen here in Canada.

While the assessment concluded that Canada's nuclear stations are safe, we are never complacent. Our station operators have identified and acted on a number of safety improvements to further reinforce their facilities against fire, flood, seismic and other external hazards. With that I would like to reiterate that Canadian nuclear power generating stations are among the safest in the world and that this was reaffirmed following the Fukushima event.

Turning to my second theme, we will hear much about the management of radioactive waste throughout this hearing. The techniques -- the techniques that OPG employs for storing used nuclear fuel are practiced at virtually all nuclear power generating stations and subject to both domestic and international nuclear safeguard controls including inspection by the International Atomic Energy Agency. The equipment, systems and protocols used at Darlington are similar to those that have been safely used at the Pickering waste management facility since 1996 and at the Western waste management facility since 2002.

In addition, OPG has safely managed used fuel for over 40 years without an incident causing harm. OPG and other station operators are responsible for used

fuel throughout the short and intermediate term storage periods where they manage the waste onsite. With respect to the long term care of used fuel the Nuclear Waste Management Organization NWMO has been assigned responsibility by the federal government under the Nuclear Fuel Waste Act.

Since 2002 the NWMO has been working with government, industry and most importantly the public to develop an innovative, collaborative approach to the on-going management of used fuel. It is currently engaged in conversations with 21 communities interested in hosting a deep geologic repository for the storage of used fuel.

Our industry understands what a significant role host communities play. For example, it was only with the endorsement of the municipality of Kincardine that a deep geologic repository was selected as the preferred technology for the continued management of low and intermediate level radioactive waste within their municipality. We submit to this commission that OPG has ably demonstrated its ability to manage its radioactive waste and in a manner that is acceptable to its host community.

We at the CNA have every confidence that it will continue to manage the waste generated at the Darlington nuclear site in the safe and responsible manner

that it has in the past. We are just as confident that the NWMO will continue to advance its mandate and that all of the used fuel in interim storage at Darlington at the Darlington nuclear site will be heavily monitored and highly regulated in the long term.

Finally, a large number of the interventions have commented on the high cost of nuclear power generation. I would like to offer our perspective on this. We note that the upfront capital costs of power are sometimes confused with the overall costs of power. This is like saying that because a house costs hundreds of thousands of dollars and a hotel room costs 100 or $200, living in a hotel room is more affordable. The upfront costs of nuclear power are more than offset by its long and reliable operating life and by the very low fuel costs. In contrast the upfront costs of a solar panel or a single windmill may seem affordable but they generate a lot less power and don’t necessarily generate power where or when we need it. Similarly, a natural gas plant may cost less to build than a nuclear power generating station but the fuel costs are high and might double or triple over the lifetime of the plant.

What matters is the average cost per kilowatt hour that is delivered to your home, business or automobile, plus the reliability of that power. Nuclear

has delivered power safely, reliably and affordably for decades. It has been there for us when the wind doesn't blow and the sun doesn't shine and with very low fuel costs. The Darlington station does all of this cleanly and safely. It is not a hotel room. It's a house. It is a valuable, well designed house that has not yet reached its midlife and should not be abandoned. It would be economically irresponsible not to capitalize on the remaining value of this asset.

Another consequence of large, long-lived capital investments is long-lived jobs. In October of this year the CNA in partnership with the Canadian Manufacturers and Exporters published the results of a study of the economic benefits of nuclear in Canada. The study showed that investment in this industry including mine expansions, plant refurbishments and new facilities predicts 40 percent job growth over the next five years. The study confirmed that while the nuclear industry already sustains tens of thousands of quality jobs, there is the potential for 24,000 more over the next five years.

We are a 6.6 billion per year industry which provides good quality jobs that require and inspire high levels of education, training and skill. As employees and business people we contribute 1.5 billion in taxes and 1.2 billion in export revenues annually.

In summary, President Binder and commissioners, as you can probably tell, the CNA and its members are passionate supporters of our industry and we feel very strongly that you should approve the application before you. Thank you very much for this opportunity and I would be pleased to answer any questions you may have.

THE CHAIRMAN: Thank you. Questions? We'll -- we'll wait a second, let the Commissioner first ask questions. Mr. Tolgyesi?

MR. TOLGYESI: Thank you, Mr. President. Is the Canadian Nuclear Association, is membership to become a member to remain a member, conditional to performances or thresholds in health and safety, sustainable development which means environmental or social involvement and acceptability or anybody who wants to become a member who is related to the industry applies and you have some criteria to select?

MS. KLEB: Heather Kleb for the record, the Canadian Nuclear Association represents uranium mining and exploration, nuclear power generation and the advancement of nuclear medicine. We also represent members who are consultants, suppliers to our industry, you know, affiliated universities. We do not have a -- a code of conduct that is currently applied to our members but we all choose to work in the nuclear industry and we choose

it every day and not only that, I encourage young people to seek jobs in the nuclear industry when they approach me.

THE CHAIRMAN: If you want to ask a question, could you submit it to Louise, in the back, and it'll come back to us.

Okay, who else?

I'd like to -- I meant to state -- you said you did a survey in 2012 on -- I'm trying -- can you talk a little bit about was it a Canadian-wide survey? Was it Ontario survey, and what's the result, and where can they be found? And was it done -- when was the actual survey done?

MS. KLEB: Heather Kleb, for the record.

We conduct a number of surveys, so are you referring to our across Canada surveys?

THE CHAIRMAN: Well, it says on page 3 -- I'm referring to your page 3 submission between 2012, May 2nd, May 12th; I guess that's when it was done.

MS. KLEB: That's our polling -- right? I'll kick it off and then I'll pass it over to my colleague John Stewart.

But those survey results show a consistent support for the nuclear industry above 50 percent in Ontario, closer to 30 percent across Canada. But

interestingly, the -- post Fukushima, there didn't seem to be a significant impact on those numbers.

John?

THE CHAIRMAN: So the result -- are the result posted on the website?

MS. KLEB: Yes, Dr. Binder, I believe they're public and we would certainly be able -- be willing to make them public.

THE CHAIRMAN: And are they -- there's a, you know, like the demographics and the normal kind of polling breakdown?

MS. KLEB: That's right, by male/female, by province. I believe age demographics as well.

THE CHAIRMAN: Okay, anybody else?

Do you -- okay, while we're waiting for this question to come, let me -- what's your reaction? I don't know if you've been listening for the last two days, and this morning; what's your reaction to some of the comments you're getting as an industry?

MS. KLEB: Heather Kleb, for the record.

I have to admit I've been in meetings a lot the last couple of days, but if I was free, I assure you that I'd be watching. I'm always interested in hearing what members of the public have to say about our industry and this is a good forum for doing that and I'm quite

willing to listen to their unguarded opinions.

THE CHAIRMAN: Okay. I don't think it's related to the nuclear industry but I'll ask this question anyhow. It's not -- it's really a bit out of scope here, but maybe OPG can comment on this.

The question is the price of uranium is falling, I guess, and -- right now it's falling. What's the market, it's falling? In fact, all production in Canada is now on a very stopgap, and I thought you were going to ask the reverse; isn't it the beginning of an end? But it said -- okay, let's ask the question the way the intervenor proposed to ask it.

It's increasing constantly and that is the main reason why countries like Australia, China, and India are actively working on Thorium fuel. Now, we talked about Thorium yesterday. I don't know what the question is; it's more like a statement. So the point here is that we've discussed Thorium and if you haven't heard it, I think you can probably read it in our decision.

So thank you for that and thank you for CNA presentation.

MS. KLEB: Thank you.

THE CHAIRMAN: The next submission is an oral presentation from Mr. O'Morrow, as outlined in CMD 12-H13.106.

Please proceed.

12-H13.106

Oral presentation by

Michael O'Morrow

MR. O'MORROW: Good afternoon, Commissioners, fellow intervenors, and interested observers. My name is Michael O'Morrow and I work for Greenpeace Canada as the Assistant to our Nuclear Campaigner, Shawn-Patrick Stensil.

I will begin by stating my unequivocal opposition to the proposed Darlington rebuild. Before moving to Toronto and joining Greenpeace in the summer of 2011, I was oblivious to the issue of nuclear power.

My home province, British Columbia, does not operate nuclear reactors. In fact, the provincial government and its Crown corporation, BC Hydro, refuses to consider it as part of British Columbia's energy future. So you can imagine my surprise when I learned Ontario operates not one or two but 18 reactors.

During my tenure at Greenpeace I have learned about nuclear power and its significant risks, the politics that saturate the industry, and the renewable energy sources that we could choose as an alternative to

nuclear power.

Throughout the first two and a half days of these hearings many credible and respected civil society organizations have presented compelling evidence against the Darlington rebuild. I refuse to believe these organizations are inherently anti-nuclear.

Rather, these organizations are contributing to the nuclear debate by advocating for the sustainability of our environment and for the safety of our citizens, and the fact they have spoken out against the project is based on a presentation of facts, not bias or opinion.

Perhaps most importantly, however, are the many common citizens who have sat before you, and spoke passionately about Ontario's energy future, and expressed their valid concerns about Darlington. I share their fears and I want what they do. We want you to reconsider OPG's risk assessment and safety plans. OPG refuses to consider large-scale Fukushima or Chernobyl-type disasters, so as a result you must.

In the wake of Fukushima, investigations by Greenpeace International and the Japanese government found the same conclusions: The disaster was man-made, a result of institutional failure.

According to Japanese officials, the

situation at the plant worsened in the aftermath of the earthquake because government agencies did not function correctly with key roles left ambiguous. Nowhere in the environmental assessment or at any time during these hearings has there been an admission for the possibility of institutional failure at Darlington.

We have heard well-orchestrated defenses of the technologies used and even if we take them as being completely accurate and discount the potential for technological failure at the site, with no malice intended, I refuse to believe OPG workers are infallible or incapable of making mistakes.

There has been some discussion already today about climate change, but I do want to touch on it just briefly as well. In OPG's written submission in the matter of proposed environmental assessment screening report at the bottom of page 2 it reads:

> "The biophysical environment in the vicinity of DNGS is very stable with only moderate and generally predictable variations and conditions that might affect operation of the plant. This confidence in predictability considers climate extremes, for example, violent storms

and seismicity earthquake potential. Because of these moderate and predictable conditions, potential effects of weather phenomena in similar events can be effectively mitigated through design and management response planning."

In their presentation yesterday, the organization of CANDU Industries called climate change a challenge of our times, and I completely agree. But with climate change being the volatile reality it is, OPG's findings of only moderate and generally predictable variations and conditions are misleading and self-serving.

According to a recent Huffington Post report, Hurricane Sandy caused nearly $37 billion in damages in the State of New Jersey alone, and in Ontario and Quebec, according to the Toronto Sun, it caused damage in excess of 100 million. While exact estimates do vary, between one and two dozen nuclear reactors were directly in Hurricane Sandy's path.

I do question how OPG's environmental assessment can determine the biophysical environment around Darlington is stable when not only -- when not six weeks ago we witnessed an erratic, violent storm that is, at least in some circles, being attributed to climate

change.

What's worse, however, is OPG's refusal to consider large-scale accidents is exacerbated by its grossly inadequate evacuation and emergency planning. At present, OPG has evacuation procedures in place for a 10-kilometre zone around Darlington. The evacuation zone around Fukushima is 20 kilometres and around Chernobyl even today it's 30.

Yesterday, the 1979 Mississauga train derailment was cited as evidence of the province’s capacity to mount a large scale evacuation in the event of an accident.

After having done a little bit of research about the accident because I wasn’t aware of it, I do believe that using this event as an example of emergency response preparedness is in fact misleading.

After the derailment, according to an estimate on Mississauga.com, 218,000 people were evacuated. In a report by the Centre for Spatial Economics that is available on the Greenpeace Canada website, an accident at Darlington with a 20 kilometre range would dislocate 477,000 people, more than double the amount in the Mississauga example.

In addition, if the Commission desires to use an accident from 1979 as proof of the province’s

emergency response preparedness, I would recommend it considers the cultural changes our society has experienced in the 33 years since.

In the event of a major nuclear accident, one of the overwhelming challenges in controlling the event would be the information people receive. We are connected like never before. Every day our world gets smaller and our communications more instantaneous. In 1979, before text messaging, Twitter and Facebook, people received their information from far fewer sources and those sources were authorities or individuals or organizations they could trust.

That is no longer the case. The immediacy of communications amongst individuals in today’s society would threaten to descend a nuclear accident into unbridled pandemonium before evacuation containment plans could be put into effect.

Furthermore, considering recent large scale environmental disasters, including Fukushima and the BP oil spill in the Gulf of Mexico, where corporations and government have been criticized for releasing inaccurate and misleading information, I do believe public trust in its institution is very low.

Which makes me wonder, if as the representative from Emergency Management Ontario stated

yesterday, the province has plans in place for a large scale evacuation, why were they not included in OPG's environmental assessment? Would it not make sense in an effort to assuage public fears, to communicate a robust preparedness on the part of OPG and EMO to handle any event that may occur. I do believe that it would. But I believe the reason these plans were not included is the same reason large scale accidents have not been included.

The lack of information available within the public's sphere pertaining to nuclear power has kept many people oblivious as I once was. If OPG included large scale accident scenarios in emergency planning in its assessment, it would be an acknowledgement of the potential for such events and I believe would result in far fewer oblivious people who would suddenly become engaged in the nuclear debates.

Complete and accurate information is essential for people and organizations to engage in critical discussions and to make rational decisions. By limiting the information available to the public, by refusing to acknowledge the potential for large scale accidents and the need for emergency planning, OPG has restricted the potential for those critical discussions to take place.

The Commission has stated many times in the

first two-and-a-half days that it does not have the mandate, nor is it required, to consider renewable sources of energy as an alternative to nuclear power.

What it does have, however, is a motive to limit the debate surrounding nuclear power so that nobody considers renewables as alternative sources of energy. One after another intervenors have sat in these chairs and cited examples of leading world economies, such as Germany, that are diversifying their energy production by cutting the switch of nuclear reactors and are instead investing in renewable technologies and infrastructures and green jobs.

This is not part of our discussion, however. Instead our discussion involves the investment of tens of billions of dollars into dangerous and antiquated reactors because the information that has been presented is incomplete. And that information is incomplete because should Darlington be approved for rebuild, it will strike a blow to Ontario’s green energy industry from which it may not ever recover.

The aforementioned civil society organizations that have participated in these hearings have done an admirable job towards completing the information and rounding the debate by providing detailed information about the real environmental risks and costs,

but it is not good enough.

The Commission must recognize the need to continue this discussion by, at minimum, elevating OPG's proposal to its highest level review and by demanding full accountability and transparency with reference to the risks and dangers associated with this project.

In conclusion, I would like to take a moment to respond to the comments made yesterday by the professor from the University of Ontario, Institute of Technology. He said yesterday it seems to him that certain critics are unwilling to accept any risks and I quote:

> "Life without risks is simply not possible."

He then stated that the greatest risk associated with the Darlington rebuild was driving out to the hearings and that we all had a greater chance of dying in a car accident than we ever would dying in a nuclear accident.

Perhaps that is in fact true. But I chose to come here today, as did everyone in this room. Each person who is out driving along the street or on the highway in the GTA right now is choosing to sit behind the wheel of their car. And each of us chose to accept the associated risks even if it was passively.

The professor's outrageously flippant comments yesterday dismissing public concerns is suggestive of a nuclear industry that has grown arrogant and complacent and needs to be held accountable for its planning and the information it offers to the public.

(APPLAUSE/APPLAUDISSEMENTS)

I urge you, Commissioners, to hold them accountable, to allow this debate, the information and bring it to the form it desperately needs so that ultimately you fulfil your mandate as a Commission to protect the health, safety and security of Canadians and the environment.

Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you. Okay, the floor is open. Who wants any question? Okay, thank you.

Thank you for his presentation.

MR. O'MORROW: That was good enough, thank you.

THE CHAIRMAN: He did. It was his first and last.

The next presentation is from an oral presentation from Ms. Townley-Smith as outlined in CMD 12H-13.107.

12-H13.107

Oral presentation by

Kimberley Townley-Smith

MS. SMITH: Good morning Commissioners.

My name is Kimberley Townley-Smith and I'm here today as a concerned citizen and my sole concern is safety and my problem is that my safety is in your hands.

I have to trust you, and I'm not sure that I can.

Throughout a lot of your materials you talk about how safety is in our DNA. And if you look at the structure of your statute, there is certainly things that could suggest that. It's full of all sorts of good procedures that you could be following, full hearings, real evidence, real discussion.

But the problem is you don't use it. There is no sworn testimony and there is no cross-examination. So there's nobody here or there's no opportunity for there to be a balanced debate.

I hear what your staff says and I hear what the OPG says and I'm sure that what they say they've considered, but what you haven't considered, by not doing proper procedures and using the opportunities that you have by your own governing statute, you have to consider

the other side of the story.

You are not allowing for a reason debate and you cannot -- because you don’t, you cannot convince me that any conclusions you make are based on all relevant information.

You only allow people ten minutes to speak and maybe for the public, for people like me, that’s enough. Maybe in my case, that’s too much. But there are so many people that I’ve encountered having becoming aware of this issue that have expertise, that have studied this issue, that have information and they need more than ten minutes to explain to you all the problems that they see in the thousands of pages in all of the safety data and surveys and research that they have done. But you don’t give it to them.

And my main problem with the way that these hearings are being conducted and the way that you conduct hearings in general is that it is set up, by your own admission, to be an adjudicative tribunal.

You’re supposed to be like a court and you’re supposed to be deciding like the court and yet you don’t follow any of the procedures that would ensure that your decisions are as sound as the decisions of a court are supposed to be.

And your decisions, and the manner in which

you make them and how you arrive at them, they're my guarantee of safety, my only guarantee of safety. And I can't rely on them.

I also have concerns about the CNC and how it seems to understand its role or misunderstand its role. If you are an adjudicated tribunal, and you're an actor in it, you have to be a judge or an advocate, you cannot be both.

Yet I see on your website and in materials relating to you, you're writing letters to the Montreal Gazette. You're selling people on the nuclear industry, educating children. That is promotion and that is not the job of an adjudicative regulator.

I have some slides from one of your presentations to the OPG Board of Directors and my first reaction to this is, what is the CNSC doing making a presentation to the OPG? They apply to you for licensing. You judge their applications. It would be like a judge going to the Board of Directors of Xerox and saying, hey, come to us. We'll judge you, we give good justice. This is supposed to be separate from the industry. You are supposed to be independent. You're not supposed to be talking to them about what they should be doing to make sure that they get approval.

From the same presentation, another example

of how you've -- what you are doing gives me such concern. Responsible Resource Development, this is a policy of the Federal Government. And I mean, I'm not going to waste my time here but I would actually suggest that it should be entitled Irresponsible Resource Development but for the purposes of this hearing, and the CNSC, you are supposed to be arm's length. You are a public regulator and you're only mandate is to consider public safety. Government policies, misguided or otherwise, are none of your business.

This is another slide from the same presentation, communication. Communication has never been more important for the CNSC. We're online, we're doing outreach activities, we're on Facebook and we must be in communities early, building relationships. It's part of our mandate.

Well, if you understand that you were an adjudicative, independent regulatory authority, you would understand that in fact, communication is not part of your mandate. The Supreme Court of Canada does not have a Facebook page. The Chief Justice, Beverley McLachlin doesn't wander around Canada talking to people about what the good work they do up at the Court.

You have to convince me that you are doing your job. You can't do that just by telling me that

you’re doing your job or anybody else through communication. What you have to do is show me that you are doing your job and the only way you can do that is by doing it properly.

And just before I leave this, these monkeys. I’ve actually found this slide because the Ontario Waterkeepers told me about it and they were appalled because they interpret it as you saying, let’s communicate with the public, they’re a bunch of monkeys, which is kind of an offensive thing to be saying but I look at it and I say, well, you know, the three monkeys in western culture actually represent or signify people turning a blind eye to impropriety.

And so in this context, it certainly open to your interpretation, the CNSC making a presentation to the OPG, saying hear no evil, see no evil, say no evil. You are the monkeys in this picture. That’s what it looks like.

Now you know what? I refuse to believe that you deliberately meant to do that, to make yourself look so foolish but I believe that when you did that, whoever wrote this wasn’t paying attention. And that’s the problem. If you guys aren’t paying attention, then I have no confidence in you.

In conclusion, it took me 10 minutes to

discover this thing called regulatory capture. It took me another 10 minutes to discover that the sole cause that's been attributed to the Fukushima disaster was regulatory capture of the Japanese Nuclear regulating -- Regulator by the nuclear industry and that they were told, and said exactly the same things; it's safe, there's never been a reaction and it happened anyways.

It took me another 10 minutes to hear from Greenpeace and the Ontario Waterkeepers of their complaints about how the reviews that you do in this case and regularly do, the way that you conduct them, are not proper and don't provide an adequate review and an adequate way to make to reasons, decisions. And it only took me 10 minutes and I said, okay, enough. I've heard enough.

And it took me half hour to do some web surfing on your website and elsewhere, to get enough evidence for me to conclude that you are showing all the symptoms of regulatory capture. So that's it. It took me an hour. An hour to be concerned and to come to the conclusion that this disease called regulatory capture, I'm pretty sure the CNSC has it. And if you have that disease, then we're all at risk and the same risks that could happen -- that happened with Fukushima.

THE CHAIRMAN: Thank you.

MS. TOWNLEY-SMITH: I'm not finished. I respectfully ---

THE CHAIRMAN: You are finished.

MS. TOWNLEY-SMITH: --- I have just one sentence. If I respectfully request -- since regulatory capture of the CNSC is the biggest danger to me and the other nine million people that drink out of Lake Ontario, we need a cure and I respectfully request that if the CNSC is not willing, the members and the currently -- as the Commission is currently constituted, to find a cure, then I request that you resign so that we can find people who will.

THE CHAIRMAN: Is that supposedly -- I suppose you are a lawyer and as a lawyer, you know what the cure is. You don't like the thing, go to the court. Okay? And don't insult us with some very superficial analysis -- illegal analysis. Now can I open up the floor for question? Anybody has any question?

So let me start by actually explaining, one more time, the three monkeys. And if you actually did your due diligence, you'll find out that in our Act, under Section 9b, in case you haven't found it, we have statutory obligation to reach out to the public and disseminate fact and information. And that's part of what we're trying to do.

And my three monkeys that you're scolding the industry for not doing enough explanation, so people like you understand what this is all about. So you'll get your say. I've heard you for 10 minutes now. I would like to have our Commissioner ask whatever kind of question he'd like to ask. Anybody has any question? Okay, now you've got your last word.

MS. TOWNLEY-SMITH: Alright, well I would like to respond to what you said to me. First of all, if that is in your section, I would say that it's something that needs to be removed because it is inconsistent with the role of an independent regulator. It's not your job.

THE CHAIRMAN: Do you know how to remove statutory? You're barking up the wrong tree. Go to Parliament and try to get this removed.

MS. TOWNLEY-SMITH: Okay. So -- and thank you, but, you know, again, it's your responsibility. You're the person who is being represented here.

And as for the three monkeys, I didn't do this, I didn't put it in your presentation. I'm sorry that it has obviously offended you. But I would say as well, that you are the President of the CNSC Commission, you should know better.

THE CHAIRMAN: Thank you for that.

Dr. McDill?

(APPLAUSE/APPLAUDISSEMENTS)

MEMBER McDILL: Sorry, I didn't manage to get my comment before that last exchange.

If I may, with respect to information such as the video which we were shown -- which was shown on the first day and is available on the Commission's website, do you think a video like that -- this is sort of falling on your Facebook comment -- helpful in terms of describing to the public some of the complexities of the CANDU system?

Not saying whether the CANDU system is right or not saying whether the CANDU system is wrong, just saying this -- these are the safety features embedded in the CANDU system.

MS. TOWNLEY-SMITH: I'm sorry; I'm not familiar with the video. Are you talk -- speaking of a video that's on the CNSC website?

MEMBER McDILL: The one concerning the -- the various features of the CANDU system in terms of it -- it starts with what is a CANDU reactor because, for the moment, all the reactors --

THE CHAIRMAN: It was shown here on Day 1 --

MEMBER McDILL: Yeah.

THE CHAIRMAN: --- by staff. And it's available --

MEMBER McDILL: I’m not sure if there are other videos on the website, so I don’t know all the videos on the -- that might be on the website. The one in particular we…

MS. TOWNLEY-SMITH: I’m trying to understand your question, is it -- the context for your question. Are you referring to something that the CNSC is putting out?

MEMBER McDILL: It is on the CNSC website, yes. And it is -- it is there to help the public, whether they agree or disagree with nuclear power -- how the CANDU system has various levels of safety features that are there for the protection of the public.

So getting back to -- whether you believe or do not believe in -- my concern is -- my question is you feel that that is also inappropriate to be on a Commission website?

MS. TOWNLEY-SMITH: Well, what I would say is that the Commission -- I don’t want to see the Commission telling me what somebody else has told them about CANDU reactors. I’m certain that that came from CANDU.

What I want to see from the Commission, is not only that you’ve seen that video, but that you’ve considered it, and that you’ve given people, with a

different view, and with other information, an opportunity to respond to it.

I want to see -- I don’t want to see anything from you that hasn’t been the result of a debate and reasoned consideration with information from everybody.

Does that answer your question?

THE CHAIRMAN: Okay, thank you. Thank you for this.

We will now break for lunch. We’ll come back at 1:30.

Thank you.

--- Upon recessing at 12:36 p.m./
L’audience est suspendue à 12h36
--- Upon resuming at 1:30 p.m./
L’audience est reprise à 13h30

THE CHAIRMAN: Okay, we are back and ready to move to the next -- we’ll move to the next submission which is an oral presentation from Ms. Clune as outlined in CMD 12-H13.187.

Ms. Clune, the floor is yours.

12-H13.187

Oral presentation by

Kelly Clune

MS. CLUNE: Sorry about that. So I'll start. Darlington; no expansion, no refurbishing because no risk is acceptable when alternatives are available.

Those of you who are parents may be familiar with this phrase. No risk is acceptable when alternatives are available.

When our children are involved in a situation that presents potential harm, we work hard to find alternatives that are safe to keep them safe and healthy. When the health and safety of our children are at stake, no risk is acceptable when alternatives are available.

I'm here today not to argue the science or to debate the technology of nuclear energy. I'm here today as a mother who's concerned about the health of our planet and the legacy that we choose to leave our children.

In 1981, my first child was born. This was the same year that construction began on the Darlington nuclear plant. Fresh in my mind, was the nuclear meltdown at Three-Mile Island in 1979.

In 1986, when the Chernobyl disaster

riveted the world, I was at home with my babies, five, four and two. The horrific images of those whose lives were destroyed from this nuclear project must remain in our memory if we hope to avoid further damage.

So I would like to just quickly show you a few of the pictures here that -- that I think are important for us to think about and remind us why we need to consider safer means of energy.

(SLIDE PRESENTATION)

MS. CLUNE: And I'd like to allow for a moment of silence to remember those who have been harmed by radiation and allow us time to think about those that we love, how important they are to us, and how lucky we have been so far.

(SHORT PAUSE/COURTE PAUSE)

MS. CLUNE: Nuclear energy is an extremely dangerous project. Decades of mistakes, accidents, and disasters are evidence that people and machines fail. Promises by the nuclear industry to mitigate these failures, these dangers are unsatisfactory.

Mitigate is a word frequently used by the nuclear proponents. Since the nuclear industry cannot guarantee safety they promise to mitigate dangers. To identify them, implement systems to reduce them, and when all else fails attempt to manage the risks.

Of course managing risk becomes a big problem when human life is destroyed or damaged. And that's when the information is difficult to access or is censored. Like the John Mayer song, "When they own the information they can bend it all they want".

But we know that nuclear accidents have displaced whole communities, contaminated our air, poisoned soil and water, and destroyed food and hope for the future. The Fukushima disaster is a recent example.

We also know that nuclear accidents have caused serious illness, injury, and death to hundreds of thousands of people around the world. People and machines will fail. Experimenting on our children should no longer be tolerated. No risk is acceptable when alternatives are available. Nuclear waste poses a serious threat to human life and our environment.

Frequent spills contaminate our air, land, and water. Mishaps require defueling or draining of radioactive water. Reactor fuel, core debris, spent fuel rods, these are all too dangerous. There is no safe way to dispose of radioactive waste. These are time bombs that will cause damage sooner or later to some degree or another.

We hear stories about where these time bombs are stored or dumped. Some suggest that farmers are

paid a stipend to store them in their fields or ponds. Is Chalk River one of those locations? How many other communities are storing these radioactive time bombs and where are they?

Linguistic detoxification is a devious strategy used by the industry to mitigate the danger of dumping radioactive waste. They talk about long-term repositories to store it in. We should call it what it is; land for dumping hazardous waste. But then no sane community would allow it.

We have no idea what to do with nuclear waste. Yet, we can consider expanding or refurbishing the nuclear -- the Darlington nuclear plant. What will be done with the contaminated soil and debris from renovating this facility? Where would the hazardous material be disposed of? What is the plan to deal with the equipment and uniforms which would be contaminated during the renovation? How would these items be dealt with? What are the safety precautions for now and for future generations?

To expand or refurbish the Darlington nuclear facility is a risk that will cause some degree of harm sooner or later. Certainly it is wrong to dump on another community. But it is irresponsible, in fact criminal, for one generation to knowingly cause harm to

another generation. No risk is acceptable when alternatives are available.

The nuclear industry is a giant, a multi-trillion dollar industry subsidized by public taxpayers.

By following the money trail we might better understand why we continue down this path of destruction. Mitigating the negative consequences of nuclear generated power is extremely expensive. But as long as the public taxpayer is responsible for financing this industry and its waste, a few people and a few corporations will profit.

Employees of the nuclear industry receiving a lucrative income will justify nuclear energy as a necessary tool for our society. Friends and families of those employees will undoubtedly adopt the same agenda, as will businesses that benefits financially from working with the nuclear industry. And depending on who is paying, this very Panel may also be biased.

And I think about Cree Indian prophecy that offers a good message for those that are blinded by their finances:

> “Only after the last tree has been cut down, the last river has been poisoned and the last fish caught, only then will you find that money cannot be

eaten."

Will it matter how much money you have? Will money save you from a nuclear disaster? No. No risk is acceptable when alternatives are available.

Nuclear accidents have caused horrific damage. The meltdowns, leaked poisons, radiation, the accumulation of hazardous waste, all dangerous to both present and future generations.

People want to see a phase out of nuclear generated power.

(APPLAUSE/APPLAUDISSEMENTS)

MS. CLUNE: Don't judge the number of those opposed to nuclear power by the six or 700 submissions that you received during this process. Many people would be unable to attend these sessions because of work schedules, health, distance, and possibly not even being aware of this forum.

There are a growing number of people who are legitimately concerned about nuclear energy and its waste. People are taking action to support positive changes and safer alternatives for a healthier planet.

Since it is possible with existing technology to generate clean and renewable energy for less than half a cent per kilowatt hour, the safer energy alternatives also make financial sense.

Nuclear energy poses too serious a risk to human health, our environment and our economy. You have a choice; you can choose to phase out nuclear energy, you can encourage financial support for safer energy options, you can help to protect the future of our children and theirs.

There is a better way. No risk is acceptable when alternative are available. I'm asking you to please say no to the request to expand and refurbish the Darlington nuclear plant.

THE CHAIRMAN: Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Questions anybody?

Mr. Tolgyesi?

MEMBER TOLGYESI: The intervenor is saying that radioactive waste locations are often unknown without any surveillance or control. Could OPG comment on nuclear waste storage practices?

MR. TREMBLAY: Pierre Tremblay, for the record.

I'm going to ask Terry Doran the Vice-President for Nuclear Waste Management to talk a little bit about our operation, the precautions we take and the oversight that's applied to those facilities.

Terry?

MR. DORAN: Thank you, Pierre. Terry Doran, for the record.

As we've discussed previously we look at each type of waste and the waste stream generated.

First and foremost, as mentioned, we have waste minimization plans at each of our facilities to ensure waste is appropriately dealt with in the classifications.

We've mentioned that we generate low, intermediate level wastes which can then further be processed by transfer to our interim waste management facility at the Western Waste Management Facility.

In the case of used fuel, we have a proven track record that we can account for every fuel bundle ever generated from an OPG facility. And these are stored at each of the facilities to which they're generated in a safe, secure, robust, tri-storage container inside purpose-built buildings.

So we have a complete inventory that is computer based as well that we are able to track all the waste that's generated.

MEMBER TOLGYESI: And just a last one; what are -- what's the regulatory framework which has guided the nuclear waste storage facilities?

MR. JAMMAL: Ramzi Jammal, for the record.

One comment I would like to make before I pass it onto to my colleagues.

The CNSC regulates the nuclear energy from the rock in the mine all the way to the final destination. So we apply the principle from the cradle to the grave.

I'll pass it onto Mr. Don Howard or Peter Elder in order to respond.

MR. ELDER: Peter Elder, for the record.

I just want to confirm that all waste facilities in Canada or anywhere there is nuclear waste, requires a licence from the CNSC. There's a complete list of all facilities that have a waste licence on our website.

THE CHAIRMAN: Thank you.

Dr. McDill?

MEMBER MCDILL: The intervenor did ask one specific question with respect to Chalk River, I believe, and I couldn't -- even though it's not part of this hearing, could staff describe the types and facilities for waste at Chalk River?

MR. ELDER: Peter Elder, for the record.

There are a number of waste management facilities at Chalk River. All are under the site license, the site CNSC license for Chalk River. But I don't think that's the point she was trying to make so I

don’t know if...

MEMBER McDILL: Well let’s talk about legacy waste. What’s happening to the legacy waste at Chalk River?

MR. ELDER: So there is a program to deal with the legacy waste that is funded by the federal government. Again we are not involved with the funding in that program. What we do the regulatory oversight of that program to clean up all the nuclear legacy that’s associated with Chalk River.

MEMBER McDILL: Does that answer your question?

THE CHAIRMAN: Okay, you ask...

MS. CLUNE: No. We have no way of dealing with nuclear waste. And it’s easy for us to be smug about the dangers that nuclear energy brings and I think we need to be reminded about the dangers and about the future of the children that we’re leaving our future to. It’s completely irresponsible for us to continue on this path.

Thanks.

THE CHAIRMAN: Okay, thank you. Thank you very much.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: The next submission is by FullCircle Energy Solutions Inc. Tritium -- Trillium

Power Wind Corporation and Solsmart Energy Solution, as outline in CMD 12-H13.109 and 13.109A.

And I understand the submission will be made by Mr. Young.

12-H13.109 / 12-H13.109A
Oral presentation by
FullCircle Energy Solutions Inc.,
Trillium Power Wind Corporation
And Solsmart Energy Solution Inc.

MR. YOUNG: Yes, thank you, Chair, Commission Members. My name is Chris Young; I'm with FullCircle Energy Solutions.

I have a number of supporting -- I guess -- contributors to this -- about 50 renewable energy companies stand behind this. We've come at this ad hoc and in short notice, so forgive me if I drift and maybe off topic somewhat.

By way of background; I headed up a company that put up 30 megawatts, about $140 million solar project so I can tell you for certain that solar does produce electricity on a reliable basis.

I'm here today to basically ask the CNSC to direct this project to a full borne environment

assessment, primarily based on the socio-economic impacts that have been overlooked in this process.

Disclosure to the people of Ontario, the people of Canada I think is really important in this. In that this whole process comes with a very significant and real moral hazard. We have an organization that is proposing to put up a project and operates a project that has no real financial stake in the game given that there's a $75 million liability cap.

The CNSC itself doesn't have to have any vested interest in this; there's an indemnity for CNSC and the Commission Members. So there is a real need to disclose this to the people of Ontario.

Dr. Binder, you had mentioned the "doomsday" scenario. And doomsday is one thing -- I'd like to call it a "Black Swan" event because black swans are something that -- are mythical except they exist.

And, you know, random probability says that this is not going to come up with any consequence. The reality is if there is a consequence, nobody can afford to live with it. The sun will come up but people have to live in the community that's affected.

Quite frankly, a 10 kilometre or 20 kilometre scope of impact is very tight considering the fact that people will have to be evacuated, water will be

impacted, and people have to move on.

Essentially, one of the problems that we see is that as renewable energy developers we have to bear the costs of our decisions. The Proponent is essentially at the -- has a blank cheque from the province.

And so because of that the scope should be widened. The EA process should encompass the financial impact for this project through and through. Many people have spoken to this all the way through the hearings, I think.

A lot of people may have overlooked the financial track record of the Proponent. The Proponent has a history of running over budget. There is demonstrated losses within their hedging program. There are problems with their nuclear waste set aside. They’ve got $14 billion allocated as a liability and there’s $12 billion on their books to pay for it. So the money has to come from somewhere. That’s taxpayers of Ontario. Therefore, we should be broadening the scope and understanding what’s going on further.

When we move to the business case; we keep hearing from the nuclear industry that nuclear is cheap. In this country that’s all we hear. In Europe we hear 32 cents a kilowatt hour. 32 Euro cents is the risk adjusted cost that the German government uses.

The Brits are putting up nuclear power plants -- 14 pence, that’s about 22 cents a kilowatt hour. And that price has not been guaranteed yet. Yet, we hear 5 cents a kilowatt hour is what the cost of electricity is from Darlington. It has no basis in fact.

This is a Proponent that is using public funds as its own piggybank without having to allocate -- you know -- proper reserves because there’s always somebody else to pay.

There are thousands of people in this province who have made a commitment to renewable energy. Twenty nine thousand (29,000) people in Ontario have signed up for the renewable energy standard offer program. That’s the small residential things. In the farmer’s fields, 30, 50, $100,000 people are committing in their own pockets to get a return on investment.

There is no return on a nuclear power plant. As soon as you build one of these things it’s a liability. It’s a liability that lasts for 250,000 years. Tell me what the price per kilowatt hour is for storage, for 250,000 years. We have not seen a quantum ---

(APPLAUSE/APPLAUDISSEMENTS)

MR. YOUNG: There has been no value ascribed to an accident. We talk about emergency plans, we talk about all kinds of things but what is the value.

I’m about dollars and cents, tell me per kilowatt hour what the cost is of an accident and then let’s have a meaningful discussion about what’s the alternative.

(APPLAUSE/APPLAUDISSEMENTS)

MR. YOUNG: The Germans, the Americans, the French, the Belgians, the Swiss, they’re all moving away from nuclear power. If CANDU works go and sell it to the Brits. I don’t see CANDU running over to the U.K. and getting an audience.

If it’s electricity that OPG is worried about renewables can do it. There was some conversation yesterday in the hearings -- I was watching on the web -- about -- you know -- what is the German output of renewable energy? This is for the first three quarters of the year. So German renewables versus total OPG production, 90 gigawatts in Germany, 63 gigawatts in Ontario.

Darlington is 14.5. What do we do in Germany, 16 gigawatts -- or sorry terrawatt hours of electricity.

Talk to Angela Merkel. There are many people out there who just don’t believe the risk is worth it. The evidence proves that you can actually generate electricity, not just from wind and solar; there’s biogas, there’s hydro-electricity that can be used as pump and

store. This is a task for our engineers in this province. Rebuild the grid; make jobs not just 2,000 construction jobs here in Durham Region.

The German experience has been over 360,000 jobs last -- 380,000 jobs last year. We are -- we will hear a story tomorrow from the Germans that it'll be up around 411,000 is the current employment in renewable energy.

What's going on here in Ontario has been a war on the renewable energy sector. Threats that renewable power doesn't work, it's not reliable and all of this stuff. It doesn't add up. The reality is the sun will shine forever and ever; so will the liabilities from nuclear waste.

In conclusion, the only fair thing that can be done here is to send this for a full environmental assessment. The scope is so narrow; you're talking about 10 kilometres. If 10 kilometres -- the population within the 10-kilometre radius of this facility were on the hook for the bills and the liabilities that come with it, fine, let them build it. The problem is there are millions of people that are impacted by the decisions you make and we haven't seen any alternatives proposed, and the alternatives are real and they are viable. These are some of the people that also contributed to my hearing, and I

will finish right now.

Thank you.

THE CHAIRMAN: Thank you.

Okay, it’s open. Monsieur Harvey.

MEMBER HARVEY: The question is to the staff; why should we go to a 100 kilometre? It’s maybe a tricky question but, I mean, the intervenor is saying that we go to 10, or 5, 10, or 20 kilometre but we should go to 100; why? I should maybe first ask the question ---

MR. YOUNG: So if I may? I would suggest that the radius has to be expanded because you’re going to evacuate people into that area. So the people who are absorbing the refugees should be considered in this -- the implications should fully be considered. You know, where do you house these people; what happens in the interim? Because this -- you know, God forbid something happens, they have to go somewhere. And it’s not just the people you’re evacuating; it’s the others that are impacted on it as well. So it’s not just the 10-kilometre zone or the 20-kilometre zone, you know.

MEMBER HARVEY: Okay.

MR. YOUNG: You know, if this is a $200 billion event, the people of Ontario have to pay. What are the economic ramifications for this? It’s not considered in the economic socio impact assessment.

MEMBER HARVEY: Perhaps we should just -- is that considered in the evacuation study or emergency study, that point that the -- is this only the evacuation or the person receiving or the contours which will be -- might be touched by the fact that the people are going away? Is that considered in the evaluation?

DR. THOMPSON: Patsy Thompson, for the record. I'll explain the basis for the scope of the environmental assessment.

The impression that people are giving of the way the EA was done was that we limited the consideration of environmental impacts to a three- or a five-kilometre zone. In fact, if you read the scoping document and read carefully all the technical support documents the assessment was done without limitations to the spatial as well as the temporal scale.

What was required to be done was a careful consideration of all the plant activities under normal and accident operations looking at sources of releases to the environment, where they would go, when, and then look at the consequences on human health, the environment.

When we looked at the consequences of the accident with the beyond design-basis accident that was one in a million, the consequence of that accident was a dose of 5.7 millisievert as a one kilometre distance. And

that is not because we constrained the EA but it was because that's the consequence of the accident considered for the environmental assessment.

Under that condition, evacuation would not be triggered under the Emergency Management Plans. It is within the dose range where sheltering could be considered. If you'd like more details in terms of the overall Emergency Response Plan, I can ask my colleague to do so. I just wanted to make clear that in no way was the scope of the EA limited, either in time or in space. We did the EA to its full scope looking at all the environmental impacts over time and wherever they happened geographically.

MEMBER HARVEY: But when you have those results and then you have to plan the evacuation, if the evacuation is necessary, so ---

DR. THOMPSON: My apologies. Again, with the very serious accident that was considered for the environmental assessment, no evacuation would be required. What might be considered is sheltering, so people staying in their homes. And the dose, the 5.7 millisievert dose did not take into consideration sheltering that would reduce that dose. So it's a dose without any protective measures. So no evacuation would be considered -- would need to be considered at that dose level according to the

provincial plan.

If you look at the screening report and some of the technical studies, we did consider psychosocial impacts following an accident, and we've identified some mitigation measures to be able to deal with those types of impacts.

THE CHAIRMAN: Go ahead. Mr. Sigouin, go ahead.

MR. SIGOUIN: Luc Sigouin, Director of Emergency Management Programs.

The provincial plans do consider the impact of evacuation and have pre-planned reception centres identified in areas east, west, and north of Darlington to accept and support evacuated people from the 10-kilometre zone, or further if they needed to. So those centres are explicitly addressed in the provincial plans, and as part of some of the exercise and drills that are done, reception centres are activated and tested on a regular basis.

THE CHAIRMAN: Another question, please. Anybody? No?

I just think that the intervenor talked about the liability and I'd like some clarity about whether the decommissioning funds and the financial guarantee and all of this include all the storage costs,

et cetera. How does that fit into the decommissioning plan? And maybe staff can help on that one too.

MR. TREMBLAY: Thank you. Pierre Tremblay, for the record. I'll ask Terry Doran again, as you're really talking about waste management and securing the funds to speak, to that particular aspect.

MR. DORAN: Terry Doran, for the record.

As part of the licence conditions, we are obligated to have full costing for both decommissioning plans, as well as the management of all waste within the financial liabilities.

THE CHAIRMAN: For the next 200 -- I'm just quoting, for the next 250,000 years?

MR. DORAN: We'll be full costed to look after all waste generated from OPG operating facilities in essence.

THE CHAIRMAN: Your answer. You have the final word.

MR. YOUNG: I'm stunned, to be frank. What is the cost per kilowatt hour on that cost, that storage cost for 250,000 years? The Germans figure it's about four or five times what you're budgeting. I think they're up around $100 billion for decommissioning so I think there has to be some knowledge exchange between jurisdictions because what we're hearing in Canada versus

what’s going on in other areas, nothing makes sense.

THE CHAIRMAN: Well, a decommissioning fund; I’m not sure we have -- I’m not aware of all the numbers for the German decommissioning so I don’t know if staff can -- I thought that the decommissioning numbers are vetted by a third party and in fact they do reflect international approaches.

Staff?

MR. ELDER: Peter Elder, for the record.

I can just tell you what we do as they are based on the counting and the numbers, and the cost of decommissioning are based on what international practice is; what it’s actual costing to decommission actual plants, mostly in the United States but they’re based on the cost of actual decommissioning projects. So the number in any country is going to depend on the number of reactors that you have to decommission, which is the obvious one and I don't have -- how many -- you know, it depends on, again, there’s decommissioning strategy as well. But the numbers are compared internationally on a regular basis.

THE CHAIRMAN: You have the final word.

MR. YOUNG: I'd like to thank you for this opportunity. I think it's regretful that you can't look at all of the alternative energy options within your

mandate. I think that the ---

THE CHAIRMAN: You have another agency called OPA, we have Ontario government, and all those.

MR. YOUNG: Agreed. Agreed. Agreed, but -- and I think there is some frustration in that a lot of these hearings and mechanisms operate in silos and there is no interrelationship between the various energy interests in Ontario.

THE CHAIRMAN: Right.

MR. YOUNG: So, thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you.

The next submission is an oral presentation for Ms. Lester, as outlined in CMD H-13.37.

Ms. Lester, the floor is yours.

12-H13.37

Oral Presentation by

Carrie Lester

MS. LESTER: Hi, can you hear me? Yeah, okay. So greetings. (speaking in native language). To the Members of the Joint Review Panel, to the people behind me who may also be intervenors, to the media, and to the community, which surrounds and is affected by the

Darlington nuclear reactors, including aquatic, terrestrial, and air dwelling communities.

My name is Carrie Lester. I'm a mother; I'm a sister, an auntie, a daughter, a daughter to parents who have both died from cancer. I'm a granddaughter to parents no longer with me, and some who have died from cancer. I'm also Barefoot Onondaga from Six Nations Grand River Territory through my mother and my grandmother, but I live in Toronto.

(Speaking in native language). That's my name, my clan, and my nation.

(APPLAUSE/APPLAUDISSEMENTS)

MS. LESTER: One of the first native teachings that I have ever received was that of the Thanksgiving address. It's a daily prayer and it reminds us to be in a good state of mind and to give thanks for all that's around us; the people, Mother Earth, her waters, the fishes, the grasses, the food plants, the medicine plants, the trees, the animals, the birds, the winds, the thunders, the Brother Sun, Grandmother Moon, the stars, the four celestial guides, and the Creator.

We say these words humbly and with the greatest respect each and every day to remind ourselves of what's important because all of these things are important to each other. We are all connected and we are all of

this earth.

Another native teaching that one learns early on is that of Sky Woman and the story of creation of this Mother Earth.

Suffice to say that Sky Woman who fell down from a hole in the sky world was made to rest upon the back of a turtle, with the help of the birds, she soon -- sorry, on the back of a turtle with the help of birds.

She soon gave birth to a daughter who eventually had twin boys. The boys were opposite in nature; one creating the beautiful and wondrous things around us, while the other created disturbing things around us, but those things were often meant as protective elements. Such things as thorns on the rose and rattles on poisonous snakes, but both these elements are essential to life and they both must be learned about and understood because it's all a question of balance.

And so it is with uranium. Some things were just meant to be left alone.

(APPLAUSE/APPLAUDISSEMENTS)

MS. LESTER: One more Iroquois teaching, known as the Great Law, the Great Law of Peace, it can take up to 10 days to recite this law. But for these purposes, I'll sum it up in one phrase. Do no harm.

(APPLAUSE/APPLAUDISSEMENTS)

MS. LESTER: Clean air, land, and water are important and necessary. They're necessary to all living things. We cannot take any of them for granted and yet some of us do. Some people have forgotten to think about these things every day and to give thanks for them for their purity and their sacredness.

Some of us think -- seem to think that the solution to pollution is dilution. However, this does not work and even a child in grade school could see that once something is diluted it has spread farther out, affecting a larger area, but it is still very much there.

And when it comes to the lake that we draw our drinking water from, Lake Ontario, that's a Kahinahaka (ph) word, a Mohawk word meaning "the great sparkling waters".

The Darlington nuclear facility is not the only nuclear plant on this lake, as you all know. Lake Ontario is also the unfortunate host to the Pickering reactors, and to the two American nuclear plants, Nine Mile and Fitzpatrick, right across the lake from us, near Oswego, and that's another Mohawk word meaning “mouth of the stream”. And all these -- sorry, which all release radioactive waste, such as tritium into those once beautiful waters, and once it's there it cannot be removed.

So one of the reasons I came here today was to let you know how outraged I am. Outraged that this discussion is even taking place, angry that this diabolical nuclear experiment was even allowed to take place 60 odd years ago, and I wanted to look at each of you and know your names. To know who you are, what you do, and to see who is taking responsibility for the chronic suffering of the people and the damage to our environment, burdening us all with this radioactive waste.

Nuclear plants are just one stop on the nuclear cycle, from the extraction of the ore, to the crushing and separation of uranium, to the tailings ponds, the processing of the yellow cake, and further processing of uranium powder into fuel pellets, and the transportation of all this toxic material criss-crossing the country and the world, to become fuel, all simply to boil water to produce electrical energy, or for the other original purpose, which was to produce weapons of mass destruction.

(APPLAUSE/APPLAUDISSEMENTS)

MS. LESTER: How many people, communities, environments, and waterways have to die for OPG and a choice that is in your hands? How is it that you've convinced yourselves that OPG is doing no harm?

You need to be impartial and be looking

after the best interests of life, not salaries.

(APPLAUSE/APPLAUDISSEMENTS)

MS. LESTER: OPG's literature uses slickly crafted words to ease the minds of Darlington's neighbours and its workforce and the young families who move closer to the plant for their spouses who work there, such as this:

> "Ontario Power Generation Incorporated is an Ontario-based company whose principle of business is the generation and sale of electricity to customers in Ontario and to neighbouring markets. Our goal is to be the premiere North American energy company focused on low cost power generation whose wholesale -- and wholesale energy sales while operating in a safe, open environmental responsible manner. There are several misconceptions about nuclear accidents and how severe they may be. The design of the CANDU reactor means that accidents will be rare and not likely have any impact on the community at all. Under rare circumstances where

> an improbable combination of things go wrong, there is a chance of some impact on the community, however, this will likely develop over a number of days allowing ample time for action to take place."

Well, we just learned the other day from Greenpeace's weather balloon, that landed over at Oswego, on the other side of Lake Ontario, which I mentioned earlier, that this is one of the many directions the wind will carry toxic radioactive waste from Darlington, and it was only a couple of hours that it took to get there. We don't have three days.

So why are we seeing children, school aged children with cancer? Why are we seeing babies born with cancer? The other day -- last week, there's a hospital in Toronto, it has some construction hoardings up, and they have been encouraging people to come and write messages of hope and encouragement to those who have been stricken with cancer. There is one for a 6-month old baby.

In the news the other day there was a story of a 2 year old with cancer. She's now 4. I know of a child who I work with at a school who was born with ocular cancer, cancer in the eye.

So how dare we let OPG decide what's

allowable to enter our environment, to enter our bodies, to enter the bodies of our children and yours and theirs for that matter.

Here’s a couple of recent headlines in the newspaper. This is from January 2012, “Study Finds that Childhood Leukemia Rates Double Near Nuclear Power Stations”. Another one from May of 2000, “Infant Mortality Rates Drop Around Five U.S. Nuclear Power Plants After the Reactors Have Closed”. So where does all this early science or scientism about allowable limits come from I wonder?

At one time, radium was thought to be the wonder drug, the miracle cure for just about everything from treating birthmarks, eczema, acne, psoriasis, warts, neuralgia, ringworm and to controlling the distresses of menopause. That’s from the 1937 article called “The Romance of Canadian Radium”.

It was also used to make glow-in-the-dark clock dials and airplane control panels at the expense of many hundreds, if not thousands, of usually women who worked in those factories and they were known as the “Radium Girls”. I’m sure many of you know about them, but if you don’t; in Toronto, we had several plants that were radium dial plants.

The -- just a little bit I want to read

from here ---

THE CHAIRMAN: Can you please summarize and complete your presentation?

MS. LESTER: I'll move on, sure.

So in speaking of the radium dials, there was a building in Toronto that's about to be demolished, but it was stopped by the CNSC. It was one of the radium dial plants and it was stopped because there's still radium in it and in 2009, the city approved of the demolishment of this building, but they had no idea radium was even in there.

Another thing that's just come into the news recently is out in the west end in Toronto; it's one of the uranium -- sorry, uranium fuel processing plants that's been working there for 50 years, but the community has only just now become aware of it.

So these are just some of the -- these secret things that come out that we learn about and communities have been living with for years and not knowing what the impact of their health has been. And three levels of government had no idea that factory was even there. That's a GE-Hitachi Plant out at Dupont and Landsdowne.

So these stories, they continue and I know I don't have much time, but we're plagued with thousands

of these emissions that are not just rare occurrences. In July of ’76 in Port Hope -- we know that Port Hope is hugely contaminated ---

THE CHAIRMAN: Would you summarize and complete?

MS. LESTER: Yes.

THE CHAIRMAN: We are fully aware of the other facilities, Port Hope and the GE. Can you stick to what you need to finalize.

MS. LESTER: Well, many people are not aware of these places, many people are not.

THE CHAIRMAN: Would you please complete your presentation?

MS. LESTER: So we have Port Hope built on uranium waste landfill. In 1987 -- okay, so that’s the Port Hope.

In Toronto, we have McClure Crescent that was built on radioactive waste that nobody was aware of and these people got those houses on a lottery. They won those houses to live on and get cancer from.

The Melbourne Remedial Project, it was -- again, these are from the radium dial factories disposing their waste on land that people are now living on.

There was also a time just recently where three Canadian workers at a uranium processing plant in

Blind River on Lake Huron were exposed to 26 kilograms of yellowcake when it was ejected from the canister it was in because it was packaged likely before it was cooled and it exploded on them and they were not wearing protective gear.

So the only way I can see for this rebuild to move any further -- because many of us feel you're simply going to dismiss our concerns anyway, but would be for a full-scale environmental and health assessment. And this full-scale health assessment and accident assessment needs to be a multi-unit assessment and it needs to look at a full-scale evacuation. And ---

THE CHAIRMAN: Thank you.

MS. LESTER: Just a minute. Because for far too long we've been held hostage by the nuclear industry; financially, environmentally and through our health. So in all good conscience, it's now time to come forward and realize the error that we've made and leave that destruction behind -- and leave the destruction that's been left behind and is yet to come with the mountains of radioactive waste that we still have to be monitored forever and ever.

And there are two people who have come forward recently; they're Americans, Richard Perkins and Larry Criscione. They're two nuclear workers in the U.S.

who have come forward to show the shortcomings of American power plants because of the severe flood risks that are facing nuclear power plants down in the United States because of dams that may burst.

THE CHAIRMAN: That's it. Thank you.

MS. LESTER: Thank you.

THE CHAIRMAN: Questions please? Anybody? Dr. McDill?

MEMBER McDILL: Thank you. Thank you for your presentation.

Just one point that you raised in your discussion. You pointed out about the building in the Toronto area with the radium dials. Is there not some comfort; a little, maybe, that it was the CNSC that stopped it? That your regulator was on the ball and that your regulator caught that and the regulator was aware of it? Not me, the ---

MS. LESTER: Right. I don't know the full story behind it. I think they were actually pushed into it because of what we've been doing out in Dupont and Landsdowne, bringing that to the public's attention. And -- because this building has been ready for demolition for -- since 2009 and they didn't come forward then. And the city had no idea what was in that plant. They could have come forward then. That should have been in the planning

packages of these -- of the buildings. Wherever these are, it should be well-known where they are.

THE CHAIRMAN: Okay, you’ve got to get your facts right.

Staff, can you now discuss it. This is totally out of scope. This is not the subject of this discussion, but you have to clarify.

MR. JAMMAL: Thank you, Mr. President.

We were not pushed into anything. We know where everything is and I’ll pass you on to Mr. Elder and -- or Mr. Don Howard to give you the brief -- what is the fact behind it and the action the Commission took.

MR. ELDER: Peter Elder, for the record.

Going back on the facts on this one, we had told the building owner in 2009 and all the previous building owners about the risk, what the risks were and what the steps they had to take to deal with those risks.

When it came to our attention that the owner was not dealing those risks and had not told the city about its risks, we immediately ordered him to cease all activities and we are looking at how we are informing the City of Toronto because the City of Toronto had been told multiple times over a number of years about what risks were available in the vicinity, but obviously, we were not getting to the planning department that was

making those decisions.

But we took action immediately when we figured that the contractor working for the owner did not understand the risks that were there. And we took in -- again, this was our inspectors who went in, saw the risk and immediately put an order on them to stop all work until they had dealt with the risks.

THE CHAIRMAN: And since we are really out of scope, can you, just in one minute, describe the GE story in Toronto. They are unknown to anybody.

MR. ELDER: GE had a factory in an industrial zone -- what was originally industrial area of Toronto for about 50 years. That facility has been relicensed at public hearings numerous times over that period and there was also -- you know, we -- there is a facility. It was up there. It’s located on our website. It is identified on our website as one of the nuclear facilities in Canada and we are working very closely with the city council and make sure that people do understand what the risks are from that facility.

THE CHAIRMAN: Okay, thank you. You have the last word.

MS. LESTER: Wondering, I don’t know the woman’s name in the middle of the table there with the pink jacket, yeah, or the pink shirt. She was mentioning

how evacuations would go north and some west, but a lot east I think. So I'm just wondering why we'd be evacuating east when that's where the prevailing winds go?

DR. THOMPSON: Patsy Thompson, for the record.

I haven't spoken of any directions. I've only talked about the -- so if someone provided east, west or otherwise direction, it wasn't me.

MS. LESTER: Actually, it was you just moments ago with the other gentleman before me.

THE CHAIRMAN: It was Mr. Sigouin and I think he was talking about general emergency of any kind, not only nuclear. This is the emergency -- I don't to put words in your mouth but please clarify.

MR. SIGOUIN: Luc Sigouin for the record.

What I did say is that there are emergency reception centres identified in the provincial plans in east, west and northern direction.

THE CHAIRMAN: These are for all emergencies, is that correct?

MR. SIGOUIN: They're specifically identified in the Provincial Nuclear Emergency Plan ---

THE CHAIRMAN: Okay.

MR. SIGOUIN: --- but they could be used

for any emergency.

THE CHAIRMAN: Thank you. Your last word, is that it? We move on to the next submission by Darlington Nuclear Community Advisory Council as outlined CMD 12-H13.156 and I understand that Mr. Cryderman will make the presentation. Sir, the floor is yours.

12-H13.156
Oral presentation by
Darlington Nuclear Community
Advisory Council

MR. CRYDERMAN: Chairman Dr. Binder, Commissioners, my name is Jim Cryderman and I am reporting on behalf of the Darlington Nuclear Community Advisory Council.

First of all, on a personal note, I live approximately three kilometres from the site and have since I was five. I lived there before Darlington was constructed, throughout construction, and still live on the family farm.

Over the years I've seen a lot of change in the area. Each year my garden is sampled as part of OPG's Radiological Environmental Monitoring Program. A report is sent to me and I understand that the annual results in

the local area amount to one tenth of what you would receive from a tooth x-ray. From these results, I feel safe living in the Darlington Station vicinity.

Also, Darlington provides trails for community recreational use for walking, jogging and cycling. In addition, there are several soccer pitches in the area. These recreational facilities are located within a kilometre of the plant and are used by many residents on a daily basis. I used the trail often and believe that the environment is completely safe.

I represent the local community and station neighbors on the council. The Darlington Nuclear Community Advisory Council, formerly the Darlington Site Planning Committee, was formed when Darlington Nuclear was constructed, to provide feedback to Ontario Hydro and then OPG on station operations and public access to OPG grounds.

The council is comprised of a mix of community members, including neighbors, municipal representatives, business representatives, agricultural representatives, health and wellness representatives, educational representatives, and recreational representatives, and others.

The group meets a minimum of eight times per year and at each meeting we examine OPG’s operations

and provide feedback to OPG staff. This council has had the opportunity to learn about many aspects of OPG's operations over the years. Our group is well rounded and well positioned to provide informed comments to OPG on Darlington's Station operations and future projects.

The lines of communication are always open and when we express our opinions or identify concerns, OPG staff readily respond. Ensuring the safe operation of Darlington, including the focus of employees of personal safety, is a topic discussed at each meeting. Darlington's recent safety performance has been exemplary, having reached over 12 million hour without a lost time injury.

Over the past year, OPG staff has kept the committee and the community informed as to their post Fukushima work, including the lessons learned and the actions that they've taken as a result to ensure Darlington's safety.

The safety performance of the Darlington Nuclear Waste Management facility has also been very reliable. Its employees have never had a lost time injury since it began operating five years ago.

Darlington Nuclear is a strong community partner involved in many community events, supportive of local environmental initiatives, and helps to provide

educational events for youth in the area. Representation from Darlington Nuclear is sought after by many local boards and committees, a testament to how much station management is respected in our community.

We have received a great deal of information and have been consulted on many aspects of the Darlington Refurbishment Project Environmental Assessment which has concluded that the project will not result in any significant residual, adverse environmental effects, given mitigation measures.

The only concern that we have expressed is that any increase in traffic resulting from the project is well planned for to minimize disruption to local residents and the agricultural community. OPG has committed to work to reduce these impacts as much as possible. If the Refurbishment Project is approved, we will continue to provide OPG with comments and feedback throughout the project.

In closing, OPG is a safe operator, a good neighbor, and a trusted community partner. We support OPG’s applications before the panel, including the Darlington Nuclear relicensing, the Darlington Nuclear Waste Facility relicensing, and the Refurbishment EA for Darlington Nuclear and continued operations. Through the refurbishment of Darlington Nuclear, we look forward to

continuing this relationship for many years to come. Thank you.

THE CHAIRMAN: Thank you. Questions? Dr. Barriault?

MEMBER BARRIAULT: Just one brief question. It's the second time we've heard about probable traffic problems associated with this. Can you expand on that all or…?

MR. CRYDERMAN: That all -- it's not all from the Darlington but it's in an area where Bowmanville's increasing and the suburbs, and there are a lot of people use the roads that lead up to the Darlington Plant but they're -- it does impact the agriculture community where they have machinery on the road and slows up traffic and that's basically it.

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

THE CHAIRMAN: Dr. McDill?

MEMBER TOLGYESI: When you're looking -- you know we are looking, you -- the council comprises -- mixed of community members, et cetera. So what's the number of persons you represent?

MR. CRYDERMAN: Approximately -- I would say maybe 10 to 12 people at this moment.

MEMBER TOLGYESI: On the council?

MR. CRYDERMAN: Yes, on the council.

MEMBER TOLGYESI: They represent some other peoples?

MR. CRYDERMAN: Yes, that’s right. Yes, from different walks of life, yes.

MEMBER TOLGYESI: Okay.

THE CHAIRMAN: Dr. McDill?

MEMBER McDILL: Thank you. You said your -- I believe if I understood correctly, you said that your farm produce is checked? Do you receive the data back?

MR. CRYDERMAN: Yes I do. When they take samples I get a report later on and explains what the radiation levels are at, yes.

MEMBER McDILL: Have you felt any concern or worry or…?

MR. CRYDERMAN: Not at this point. No, I haven’t.

MEMBER McDILL: Okay.

THE CHAIRMAN: So you test food; apples and milk, all those things?

MR. CRYDERMAN: No, they test from different areas from different farms. They test milk from farmers and what not. I just have a large vegetable garden so that’s what they test in my farm -- in my property.

THE CHAIRMAN: So how do you explain all the -- you hear -- you're sitting here and you hear all the other concern by other citizen in the neighborhood?

MR. CRYDERMAN: I think maybe because I've lived in the neighborhood and I have not noticed any effects of the radiation fallout from the plant or none of my neighbors. I talk to them all the time and in my vicinity where I live, we have not -- I don't know of any cancer problems or any other health effects. And so we keep up to date on what's happening with the families in the area.

THE CHAIRMAN: Okay, thank you. Thank you very much. The next submission is by the Families Against Radiation Exposure as outlined in CMD 12-H13.110 and I understand that Mr. Kelly will make the presentation. Please proceed.

12-H13.110
Oral presentation by
Families Against
Radiation Exposure

MR. KELLY: Commissioners, CNSC staff, OPG staff, friends and neighbors behind me and to those that are watching on the live stream, my name is Derrick Kelly

and I represent Families Against Radiation Exposure out of Port Hope, Ontario.

I'm not a scientist, I'm not an engineer, I'm not an analyst of any sort. I'm a concerned citizen who became involved in looking into the nuclear issues, at least a decade or more ago. And I've learned a lot and that's how I ended up getting involved with FARE about four or five years ago now. FARE is an organization that was started in 2004 specifically to rally against a proposed deal with CAMECO to do slightly enriched uranium at their Port Hope conversion facility and over the years from that, certainly learned a lot; learned a lot about the industry, the science with nuclear as well as the radiobiology -- or the radiation biology, totally from a layman's term.

And from FARE's end what we try and do is take what we find out from the industry and from independent experts, scientists that are not with the industry, and get that information out to people. Hopefully with the idea that there'll be able to make their decision as to what they think is best, particularly regarding their life in Port Hope.

Over and above the science and the industry itself, we've also learned an awful lot about the regulatory environment, the Canadian Nuclear Safety

Commission. We know you're a quasi-judicial Tribunal. We know that you're mandated through the Canadian Nuclear Safety Control Act. We know that your scope is to regulate, licence companies like OPG and CAMECO.

But what we've also learned too is that while you're a quasi-judicial body, you're also not a democratic body. You're a quasi-democratic body at best, I guess, this is probably the politest way for me to say.

You've read my written intervention so you know where I'm coming from. That I don't sit here hoping I'm going to influence the Commissioners. I hope on an individual level, I might say something that resonates with you. But I don't expect anything that I'm going to say here today will affect the outcome of the reasons we're here for this hearing with OPG. I'm pretty sure that decision's already been made for the most part.

I mean the CNSC, part of your higher hierarchical structure, shows guidance as one of the things that the Canadian Nuclear Safety Commission does. So the reason I'm here is just to hope that others that are sitting behind and maybe watching will pick up on a few things that we say and maybe they'll then have questions that they want to ask.

There's been a lot of written and oral interventions for this hearing. And I think that would

demonstrate to our friends over at OPG here, and the CNSC Commissioners and staff that there is a real strong desire by Canadians and Ontarians for an open and public debate on the nuclear industry. And unfortunately we have to do what we're doing here because this is as good as we got.

I don't want to point fingers and blame anybody for how this whole process works. But it's got to change.

You -- quite frankly, I don't envy your positions because what you really are is a firewall that's protecting perhaps the industry and the Canadian government itself from really getting down to the task at hand which is to allow everybody that has an opinion, strong evidence, scientific or otherwise, legal, economic, to get this all out in the open.

FARE's particular interest in this is to try and reduce radiation pollution. Particularly something that we don't seem to hear a lot about at these hearings or from CNSC staff or from the industry and that's you know, specifically about the external acute exposures of radiation as compared to the internal chronic exposures; the low dose long-term, the stuff that can get into your lungs.

Well, an acute exposure of a gamma is one thing and certainly something that we want to avoid. The

body of science is really starting to look at this whole idea of internal -- long-term internal low dose exposures from radiation or uranium particulate or what be it, that emits alpha radiation into your lung or your gut or what have you and causes damage to organs, and so on which eventually leads to other forms of illness be it cancer or heart disease.

We’ve never and would we ever say that nuclear industry or living near it, as my friend here that just spoke, causes everyone to get an illness. But there certainly is an added risk for anybody that’s living around a nuclear facility.

And we argue that the numbers that are being used to set the limits aren’t done with the best intent or intentions for the citizens of Canada. We would argue from what we’ve seen based on the things I’ve said in my written evidence that it’s for the industry. It’s not based on science. It’s based on politics because the science states, and I know I’m going to hear from Dr. Thompson as we always do, about how it’s anything under 100 millisieverts per year is inconsequential or whatever. I don’t know where she gets that from myself.

Maybe everything I’m reading by everybody including you know, the -- even the U.N. and the American Academy of Science BEIR VII reports and even the ICRP’s

who are the people who do the risk model that our dose rates are set by, all accept that you know radiation -- there's a linear no threshold point, that there's no dose that's small enough that can't give you an illness.

And particularly, we're talking about these internal exposures that a Canadian can be subject to. We need to have a full and open debate about this where all the science comes out.

I've been trying to get answers for a couple of months, since the summer, from Health Canada who I understand is the body that's responsible for doing the -- and figuring out what dose rates are applicable to the public and to workers. And they won't -- they don't seem to want to have any debate or look at any of the science that's coming out of the bodies like the European Committee on Radiation Risk and there's others.

And I think as a regulator -- and well, Health Canada is the organization that's out for -- to look after our health, need to be looking at these other scientific findings or evidence to better ensure that all Canadians are properly protected.

I'll cut right to the chase here. The other day, I guess it was Monday, I got a link from somebody sending me over to a MacLean's article. And they had quoted something that is in the intervention from

FARE. And I was kind of pleased on the one hand that it was in there, but I also realized that that quote certainly needed an explanation. And I'd like to do that.

FARE, in our intervention -- written intervention said that we'd only make one recommendation and that is that we would like the Commission, the Commissioners and perhaps Mr. Tremblay for example, to petition in your case the Natural Resource Minister, Joe Oliver, in Mr. Tremblay's case it would be your boss Mr. Robbins or maybe Mr. Mitchell, I'm not sure, to talk to the proper political powers that be provincially and federally to ask that we cannot get some sort of task force struck. A non-partisan, parliamentarian and type of task force to at least examine the question of what is a proper dose for workers in the nuclear industry and for Canadians so that we can all feel safe, and that process, in turn, might allow all our friends and neighbours who've appeared here, both pro and con, for the nuclear industry, to get their voice heard where it would actually matter.

And I'm going to end it there. Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you.

Questions? Monsieur Harvey?

MEMBER HARVEY: Just a comment. You mentioned that the decision was already -- maybe already

done. It’s not true. I mean the decision is done -- is taken at the end of the process.

And we are here to protect the public. So we have to base our judgment on facts. If you come here with the idea that nuclear is no good it’s your idea, I respect your idea, but I cannot take -- base my judgment by the fact you are against.

So I need to have facts. So there’s not many ways to get -- I mean, there’s many people that come here with data’s, and they’re specialists, experts, and we listen to all the people coming here. But we have to base our decision on facts. That’s the only way we can protect the public, protect the environment, and serve the security of the population. So this is what we’re doing here.

So at the minute the government -- for example, the Government of Quebec has decided to close Gentilly ---

(APPLAUSE/APPLAUDISSEMENTS)

MEMBER HARVEY: That’s okay. But I don’t have any problem with that, but as long as Ontario wants to continue with nuclear, personally, I have to look at it and be sure that what is -- what will be done will be done correctly.

THE CHAIRMAN: Okay.

MR. KELLY: May I reply?

THE CHAIRMAN: Go ahead.

MR. KELLY: Is it Dr. Harvey -- Mr. Harvey, on your website -- on the Canadian Nuclear Safety Commission's website there's a pyramid that shows the function of the CNSC staff, and at the bottom of that pyramid one of the things that are offered by the CNSC staff is guidance to OPG. That guidance is to ensure that they are meeting the regulations -- the regulatory requirements. I could argue that those regulations are, you know, big enough to drive a -- you know, a transport through.

But I'm quite positive that OPG wouldn't be sitting here and we wouldn't be spending this money now if it wasn't pretty darn sure that all the T's have been dotted and the I's have been crossed, or the other way around.

(LAUGHTER/RIRES)

MR. KELLY: So that's where I'm coming from. There's a -- I'd be very surprised if this was allowed to happen. I mean, the staff even gives their -- at the beginning of these hearings, their report, and we saw that they were satisfactory -- I believe that was the rating on pretty much everything.

THE CHAIRMAN: Okay, thank you.

Any other questions? Ms. Velshi?

MEMBER VELSHI: I have a question for you on page 3 of your submission where you talk about the different risk models and the ICRP risk model in particular, and perhaps it doesn't accurately reflect the health risks.

And I believe it was yesterday, or may have been on Monday, that we did talk about the radiological -- radiation biological effectiveness of tritium, and that the CNSC staff did say that perhaps the dose was being underestimated by at least, you know, maybe half, that it should be doubled.

Is there more to the risk model than that tritium -- the risk associated with the tritium that the new science is showing?

MR. KELLY: My understanding, as a lay person, is that the ICRP's model that is used by Health Canada and other countries is based on external acute exposures from gamma. I believe that that -- the information the data would have come from Hiroshima Nagasaki, and that that was then formed into the model that's now used.

They did make adjustments for internal chronic exposures, but that even former Secretary of Science for the ICRP, Dr. Jack Valentine, had stated that

it’s not -- it’s not accurate enough; that the models need to have further adjustment to fully account for internal exposures with alpha.

The ECRR has done studies that I know that the CNSC staff and Health Canada don’t recognize, and this is why I say we need a full and open task force to look at this.

They say that probably the level for the public should be .1 milliSievert per year. The problem with that would be is that if that was to be adopted I’m sure that the nuclear industry here in Canada would suffer and -- you know, it’s a -- I hate to say it, but it’s all about economics, isn’t it. You know, it’s -- and we need to step outside of that and ---

(APPLAUSE/APPLAUDISSEMENTS)

MR. KELLY: So I think I would argue -- and I’m not going to get in, because I heard -- I didn’t see this morning, but I heard that one of the intervenors was talking about regulatory capture and, you know, it’s a human -- that’s a human thing. I’m sorry. No one’s pointing fingers at you for this. It’s just it’s a natural thing that can happen with a regulator.

But I think that it’s -- you know, not looking at these other risk models that have been presented that say .1 milliSievert per year and looking at

them in earnest is just an example of perhaps that concept of regulatory capture.

THE CHAIRMAN: Okay, I think, staff, can you, one more time, talk about -- and by the way, I take exception with this allegation of capture -- regulatory capture.

MR. KELLY: It’s not an allegation, Dr. Binder.

THE CHAIRMAN: You know, you ---

MR. KELLY: It’s not an allegation. It’s a ---

THE CHAIRMAN: It’s an allegation until you prove it, and I’ve not seen any -- I can tell you, we do not believe ---

MR. KELLY: I’m here just bringing up ideas.

THE CHAIRMAN: Can you talk about the actual internal versus external ICRP dose limits as determined internationally?

DR. THOMPSON: Patsy Thompson, for the record.

I’ll do it in two stages. The first statement was that the dose risk model is only based on the atomic bomb survivor cold hard data. That’s not -- it’s one of the considerations in the risk factors.

Other studies have been taken into consideration. The earlier intervenor talked about the radium dial workers. That's an internal exposure to radium. That cohort has been taken into consideration.

All the uranium miners' cohorts with internal exposures have been taken into consideration.

So there's a large number of cohort studies and radiation exposed populations to internal emitters that have been taken into consideration in the development of the risk factor.

The risk factor also takes into consideration sensitivities of different age groups, men and women, and children.

In terms of tritium, the ICRP model is an internal model. The ICRP model takes into consideration intakes of tritium in the human body, where tritium will go, into what organs. It takes into consideration not just tritiated water but also accumulation of organically bound tritium in different organs and tissues so that we have the appropriate information of tritium internally to be able to assess those and assess the risks.

THE CHAIRMAN: Okay, thank you.

You have the last word.

MEMBER McDILL: Actually ---

THE CHAIRMAN: Oh, sorry. You had -- you

have another question?

MEMBER McDILL: It's a little harder here to get -- At the risk of calling on Patsy Thompson again, as we said would likely happen, I believe -- Dr. Thompson, what did you say the incremental dose was, .306)?

DR. THOMPSON: Patsy Thompson for the record.

At the risk of being -- I've it written it down so I don't get it wrong again. So it's .6 microsieverts, so that's 0.00006 millisieverts per year is the dose to the most exposed individual around Darlington, and that is an infant living close to the plant.

And so the adopting a dose limit of 0.1 millisieverts per year would have no consequences on any of the facilities around here that are regulated by the CNSC.

MEMBER McDILL: That was the reason I wanted to get that number was because of your suggestion of .1.

MR. KELLY: Dr. McDill, could I tell you that it only takes possibly one, say, uranium particulate in a fetus' or a child's lung or an adult's lung to possibly cause an illness. I don't know how that would be measured. The probability of that is pretty great, but nonetheless, it is a probability. It can happen. And

that’s what we’re talking about.

THE CHAIRMAN: Okay. Thank you.

Anything else you want to add.

MR. KELLY: I’d just like to reiterate that it would be great if you could report to the Natural Resources Minister. I understand that is who you would be reporting you to?

THE CHAIRMAN: No, I am not. I report to Parliament through the Minister.

MR. KELLY: Through the minister.

THE CHAIRMAN: So you guys have got to understand what that means.

MR. KELLY: So through the Minister ---

THE CHAIRMAN: I don’t sit in Parliament.

MR. KELLY: Yes, I understand.

THE CHAIRMAN: I am not a Member of Parliament, so I cannot be in Parliament.

MR. KELLY: I hear you. That’s good, because I don’t remember electing you either but ---

THE CHAIRMAN: That’s right. And don’t you forget that.

MR. KELLY: But I would think you’ll be ---

THE CHAIRMAN: Don’t you forget that I’m not elected, but I report to Parliament through a Minister.

MR. KELLY: Yes, I understand. I understand your point.

THE CHAIRMAN: No, you don’t understand me because you don’t listen to what I’m saying. Reporting through a Minister is not reporting to a Minister. There is a nuance there and maybe you can get some of your legal friends to explain it to you.

MR. KELLY: Well, I stand corrected and through the Minister, perhaps you could ask that a full and open debate on this industry happens for all Canadians.

And we specifically would like the debate on what constitutes an acceptable exposure limit with the understanding that there is no safe limit, and that safe means without harm and that acceptable means adequate to meet a need. Therefore, it is a political process to determine what is adequate. Okay.

THE CHAIRMAN: Okay. Thank you.

We will take 15 minutes and reconvene at 3:15.

Thank you.

--- Upon recessing at 2:58 p.m./

L’audience est suspendue à 14h58

--- Upon resuming at 3:15 p.m.

L’audience est reprise à 15h15

MR. LEBLANC: We are ready to resume, if you can take your seats?

THE CHAIRMAN: Okay. We will move to the next submission, which is an oral presentation from Mr. Bertrand as outlined in CMD 12-H13.136 and H13.136A. Monsieur Bertrand.

12-H13.136 / 12-H13.136A

Exposé oral par

M. Louis Bertrand

M. BERTRAND: Oui, Monsieur le président et membres de la Commission, je vous souhaite bonjour et je vous remercie de l'occasion d'exprimer mes commentaires au sujet du projet de réfection et d'exploitation continue de la centrale nucléaire de Darlington.

Aux commissaire francophones, je regrette, mais je dois continuer en anglais. Si on pose une question en français, j'essayerai, dans la mesure du possible, d'y répondre.

My name is Louis Bertrand. I'm a professional engineer and resident of Bowmanville, a short distance from here.

My presentation today is about my concerns

about risk assessment and safety planning for this project.

In the early 1800s, as steam power was being developed, there was a rash of boiler explosions. This was a case of technology outstripping science's ability to understand what was going on. Stress, corrosion and metal fatigue was not understood until later, when science started catching up.

More recently, CANDU technology outstripped science's understanding of the metallurgy of neutron bombardment at high temperature and pressure, leading to the well-known problem of reduced life span on pressure tubes.

I would argue that the technology of a complex four-reactor nuclear generating station has again outstripped the ability of science, specifically the system science, to grasp the complexity.

If we consider the entire generating station as a complex system, we see that it consists of structural, mechanical, electronic software components.

As the number of components increases, the number of interactions between these components increases exponentially. In my opinion, a rebuilt and modernized Darlington would be so complex that it could not be understood as a system by any one individual or a team of

engineers, and certainly not by risk assessors, what's more, the human element must also be considered. The operating staff, management and institutional factors.

I should remind the Commission, as many intervenors already have, that the extremely serious Fukushima accident was exacerbated by what's been referred to as institutional failure.

The current assessment methods also don't consider the effects of time as the entire system or its personnel and physical plant evolves.

Probabilistic cause and effect models are no longer adequate to predict the risks of system failure leading to a radiation release accident. The discrepancy between the low estimates of serious accidents and the actual number of accidents should be cause to consider -- or reconsider these models used by industry worldwide.

Specifically, causality of event chain models is assumed to be linear. It doesn't consider circularity. Human factors are not considered: operations, management and institutions.

And the risk analysis is done as a snapshot in time; yet this assessment must be valid for the next 30 years.

One alternative has been proposed by Professor Nancy Leveson of MIT suggesting a constraint-

based system model.

Software complexity is of particular interest to myself because of my experience with software and information security. The software-based safety shutdown systems in Darlington were analyzed by formal validation methods and have earned the confidence of the regulator.

I am not debating this point and have no issues with the work of Dr. David Parnas and his collaborators on the Darlington SDS.

However, those formal validation methods are costly and unlikely to scale to more complex systems or to be able to validate a larger portion of the station control and operating software.

I argue that the task is simply too large.

The response to this concern might be, well, if there’s so much to do, why not focus on only the safety critical components. It would seem, at first glance, to be a reasonable strategy, except for the problems of defining exactly what is safety critical, and that it’s not realistic to expect a flaw in the program outside of the designated safety critical areas to not have a repercussion on the safety critical functionality of the entire program.

Another way of looking at software is that

it’s a zero-tolerance component. It’s binary. Either it works or it doesn’t. An error in design, coding or testing can have unpredictable consequences.

One more point I would like to draw your attention is operator interface software. There is speculation that the crash of Air France flight 447 in June 2009 off the coast of Brazil was partly due to a failure of the cockpit display system to accurately warn the flight crew that the aircraft was stalling. Among other factors it might have kept the pilots from understanding the situation and applying the correct procedures. And in emergency situation, human factors are a vital importance and the software design must take them into account at the design phase. One of the requirements for the operator interface is that it presents at all times an accurate picture of the systems operation including those times when there is a system fault, in other words the interface must be able to present this accurate picture to the operators despite all possible failure modes, flawlessly, and including the first time the condition occurs no matter how unlikely it may be

I have comments of a more general nature about this review process, specifically about the relationship between experts and the public. Experts are objective, they study the situation impartially,

analytical is the system. Scientific – they are using sound science, they are data driven, observations and computer models. In other words, experts are seen as rational. On the other hand, the public is subjective; they only see their own concerns. Emotional, they let the emotions cloud their judgement. Political, they bring their own agenda. Intuitive, they reject facts, go for the gut feeling. In other words, everything the experts are not, irrational. I think this quote says a lot as for someone who is from someone who for a while was an advisor to US President Obama. I'll read it for you, "When they disagree, experts are generally right and ordinary people are generally wrong." This is Cass Sunstein in a book 2004, "In complex decisions, at some point we must boil down the information presented and use heuristics, rules of thumbs; in other words to evaluate the decision. This heuristics can be cognitive, what we see, hear, read, or reason about. Or it can be emotional, what we want, what we avoid, what makes us happy, or what makes us angry." I want to specifically focus on the effect heuristic. In a simple experiment, researchers found that information about risk and benefit of nuclear power influenced the decisions of these test subjects. In A, subjects who are given the information that benefits are high made the inference that the risk is low. In B, the information and

inference were reversed, given the risks being stated as low, the inference was benefits are high. In cases C and D, the test was for low benefit giving the inference that risk was high, or that risk was high therefore the inference was that benefit was low. In this situation I would characterize the top row as the attitude of this commission, the industry, and industry staff. In the bottom row, it would be any opponent to the nuclear industry or anybody asking to make sure that risks are properly considered. Coming back to the top row, let me ask, what if the risk assessors and regulators themselves were influenced by the effect heuristic. I mean we're all human aren't we? This word keeps coming back over and over again, not credible, or beyond design basis, Alara as low as reasonably achievable. All these terms imply a subjective component to decision making. My contention is that the objective rational presentation of risk assessment is actually highly subjective and dare I say it somewhat irrational. A term like "credible" implies belief, and the minute I see that term, "credible", it tells me that the belief system of assessors and regulators is also implicated in the decision making process. In this respect, I'm suggesting that the testimony of interveners appealing to wider societal concerns is no less credible, no less valid then the

opinions of subject matter experts. I personally think that it’s valid to speculate on the career prospects of a junior employee who didn’t share the belief system of the nuclear industry. And here in this Dilbert Cartoon the intern is saying, “carry on, I’ll jump on if I notice anymore errors”.

In conclusion, I have specific requests to make of this commission. First of all, this project should not proceed without a full environmental assessment panel review. It should not proceed without a thorough examination of the institutional and human factors over the project time span; documenting software quality assurance methods for all operational software, implementing the emergency planning recommendation from the new build joint review panel, and considering a large scale accident.

THE CHAIRMAN: Thank you. Okay, the floor is open, who wants to go? Question? Okay I’m going to start I am really interested in man-machine interaction, or people machine interaction. So this is a well known kind of problem, how do you ensure no human-machine mistakes. So what kind of system you have in that can try to minimize such events?

MR. TREMBLAY: Peter Tremblay for the record.

It is a couple of elements of this issue; I mean the first aspect of this is around component design, and system design and the construction in the modification of systems that cater to human interaction. So perhaps for that, I can ask Mark Elliot to talk about the human factors program, the only other element of that is the actual interface itself in the control room sort of conduct. And for that I might ask Brian Duncan to offer a few comments. So first let's start with Mark.

MR. ELLIOT: For the record Mark Elliot, Chief Nuclear Engineer.

The human factors in design and engineering is a field that is established and in OPG we have a number of specialists in human factors that look at every design change that we make. So when we make a design change that might affect the man-machine – the person-machine interface, we would review that with a human factor specialist. For example, for the Darlington Refurbishment we've assigned a person full-time to do that because there is a number of changes being made. And those people are using industry standard approaches to make sure that those modifications are done in a way that people can interact with them, both the operators and the maintainers.

THE CHAIRMAN: Was the Three Mile Island -- was that deemed to be operator-machine problem?

MR. ELLIOT: There was operator-machine aspects to that in that, for example, one hand switch was covered with a tag and they couldn't tell – they didn't see what position the hand switch was in. So there were elements of that at Three Mile Island. There was other – a lot of other learning as well of course.

THE CHAIRMAN: So since then were there any kind of major improvement in operators and the machine? I think the intervener arguing the system is getting so complicated, how do you make sure that you use someone that is actually reading the right correct thing.

MR. ELLIOT: I'll go to Brian for the operator part of that. But just in terms of the complexity, there is a statement made by the intervener that it would be too expensive or too time consuming to call the assurance on software – other software other then safety critical software. In fact, all the control and monitoring software that we use in our nuclear plants go through software quality assurance. There is a standard CSA standard Q396 that is applied; it's a graded approach, but for their safety critical regulating, monitoring, and low safety impact, four categories and there's software quality assurance procedures applied to each of those. So we didn't find it was too expensive to do that. We carried on and have done that. And I'll turn it over to

Brian to talk about the operating machine interface.

MR. DUNCAN: Thanks Mark, Brian Duncan for the record.

Quite simply Three Mile Island was considered in the man-machine interface of the Darlington panels in the control room itself. If you'll recall, one of the key aspects of Darlington was that the staff that was going to run that facility had to all be fully trained and qualified on a simulator, which in itself was a duplicate of the control room, to prove that they fully understood the man-machine interface, to prove they knew how to work the interface, how to recognize both normal conditions and abnormal conditions and how to respond appropriately.

So if we look at, over the period of time since the station first went in service, changes to the control room were always checked out first with the operations staff. They go through a rigorous ECC process, they're checked out at the simulator. And those staff, those people I have in the control room, they're my most highly trained people. It's eight to ten years before they're qualified to operate in that control room. They spend weeks every year back at that simulator looking again at both normal and abnormal events. Always look with that – that eye, if you will, to be able to make sure

that they can recognize what's in front of them, they can react to what's in front of them, they know how to use the procedures that we have in place and that that interface is working for us.

THE CHAIRMAN: Ramzi, you wanted to add?

MR. JAMMAL: Ramzi Jammal, for the record. The intervenors talks about the examination of the institutional and human factors over project time span. The CNSC has a full dedicated division for the human factors that oversee the implementation of human factors at both levels, from existing operations, specific projects, and we have the experience with the refurbishment of Point Lepreau with respect to the human factors and interaction of the workers and the units and the design.

I will pass it on to Ms. Kathleen Heppell-Masys in order to provide us more detail and we're supported by our specialist in Ottawa for any depth he would like to discuss.

MS. HEPPELL-MASYS: For the record, my name is Kathleen Heppell-Masys. I'm the Director General of the Safety Management Directorate.

In addition to the oversight of human and organizational performance, we also do the oversight of management system, the training program evaluation and

also the certification programs of certified staff. That would include the authorized nuclear operators, the shift supervisors and the shift managers. So we take a look at each of those applications before we certify any individual.

With respect to the intervenor's point on human error, I'll bring some of the oversight we do specifically in that regard.

CNSC requires all NPPs, including Darlington, to have a human performance program. And one of its main objective, of this program, is to reduce the probability of human error. Human actions and the associated potential for human errors are also considered in the human reliability analysis, which is included in the probabilistic reliability analysis of the entire Plant.

In addition, the design of human machine interfaces takes into account the possibility of human error and includes provision for mitigating the consequences of such error. Some of the criteria that we look at as well, when we review the design of -- when we make the review of such program, would include -- just as an example, whether the probability of error is by operators and maintenance personnels, may have changed from the previous analysis. And the list goes on of many

of those review criteria that we look at. Thank you.

MR. TREMBLAY: Pierre Tremblay, for the record. Just, you know, to follow on one issue that perhaps you touched on, was the issue of the control room and indications.

In going back to Three Mile Island, I guess I'm old enough to have been around over that time period. And just to give you a personal anecdote, one of the first jobs I had on the Pickering site was to essentially examine the control room of Pickering A and look at the issue of man-machine interface, look at the alarms, the indications for the control room staff as a fundamental follow up to the Three Mile Island accident. Because you'll recall, one of the issues was not being able to actually see indications in the control room that were relevant to the event.

The other thing that happened was the subordination of certain alarms coming in, to separate the important ones from the less important ones to ensure clarity and focus of the operating staff on the necessary parameters to deal with any disturbance that occurred. So I just thought I'd give you that little perspective which is really related to this issue.

MR. JAMMAL: Mr. President, if I may add to that the -- as Commission is aware, CNSC staff did take

into consideration, as a response to the Fukushima lessons learned, the human factors in case of emergency above and beyond the normal operations.

THE CHAIRMAN: Thank you. Before -- go ahead.

MEMBER BARRIAULT: Merci, M. le Président. The intervenor raises an interesting point right on page two of Risk of Terrorism. And I would imagine security during refurbishment can -- is it fair at this point to ask OPG to comment on this and what -- what they're going to do to mitigate that problem.

MR. TREMBLAY: For the record, can we -- let me just define the specific -- this is in the written submission on page?

MEMBER BARRIAULT: It's -- and it's second paragraph from the bottom.

MR. TREMBLAY: Pierre Tremblay, for the record. Maybe I could just ask, Dietmar Reiner to talk on the contractor piece and then we'll have more to say.

MEMBER BARRIAULT: Thank you.

MR. REINER: Dietmar Reiner, for the record.

Specifically to the fact that we will be using a number of contractors on site that aren't necessarily regular nuclear workers. Those contractors

will undergo the same kinds of security clearances that our employees go through; it’s part of the process of getting the workers mobilized for the job.

We are also - as part of the refurbishment project - we are constructing a security building that’ll have all of the same type of monitoring that the main security building for employees has. So there will be metal detectors, gas detectors, scans, that sort of thing. So contractors will undergo essentially the same -- the same kinds of security clearance as in security checks that employees go through.

MEMBER BARRIAULT: Thank you. Does CNSC have any standards that apply to this?

MR. ADAMS: Patrick Adams, Canadian Nuclear Safety Commission, Senior Security Advisor for Nuclear Security Division. I just want to clarify the question that you’ve asked. Are you asking specifically to a clearance process or the broader range? Sorry.

MEMBER BARRIAULT: Does CNSC have any protocol to apply to OPG to make -- a checklist, if you want to -- to make sure that, indeed, they’re following all the guidelines to avoid problems?

MR. ADAMS: Patrick Adams. The Nuclear Security Division has a very active role in the oversight for security. We are just part of the larger security

regime in the country that looks at all the security risks, analyses threats, and looks at available intelligence and other information.

There are nuclear security regulations in place to look after the facilities and the material, material in use, storage and in transportation. And included within there is the obligation of the licensee to meet the -- be able to counter those items in the design basis threat.

In addition to that, there are requirements for OPG to carry out security clearances, to run a supervisory awareness program and they also have to conduct a threat risk analysis.

Nuclear Security Division oversees the activities of the security in respect to the nuclear oversight responsibilities of the Commission in that we undertake a robust inspection program. We have oversight activities through surveillance and we also undertake performance testing to confirm the regular of their requirements.

THE CHAIRMAN: Thank you. We'll move on.

MR. TREMBLAY: Just briefly. Is the intervenor satisfied with this approach?

MEMBER BARRIAULT: Hello, Dr. Barriault. Oui, merci beaucoup.

MR. BERTRAND: De rien, merci.

MEMBER BARRIAULT: Merci.

THE CHAIRMAN: Okay. M. Harvey, quickly.

MEMBER HARVEY: Yes, I would like to add a few comments from, maybe Dr. Thompson. On the last page of the -- la présentation de M. Bertrand -- we've got there four points, was one -- this one has been discussed. This project should not proceed without -- where are we -- well, what will we get more from such process assuming that we go by that, following that process, what will be on the table that is not on the table now?

DR. THOMPSON: That's not --

MEMBER HARVEY: Even if we accept the alternatives that are not within our mandate?

DR. THOMPSON: Sorry, so on the last page, the "should not proceed without the full EA Panel Review"?

Patsy Thompson, for the record.

So I'll start the responding and then if I'm missing anything, Andrew McAllister will complete the information.

In terms of the Panel Review, if the project had been identified as a project for Panel Review under the previous legislation, the *Canadian Environmental Assessment Act*, the scope of the review would have been very similar to what it is currently. The *Canadian*

Environmental Assessment Act is an Act to assess projects identified by Proponents, and very similar to the scope of the Panel Review that was done for the Darlington new build in terms of elements that were considered is very similar to what is actually in the technical documentations and the Environmental Assessment Report that is available and is the basis for our recommendation for the refurbishment and continued operation.

Essentially, the first step is there are consultations on guidelines so we had consultations on the scoping document so that's very similar. There was the EIS that was produced by OPG. They did some consultations on the EIS. There was a technical review of the EIS by various departments that supported the CNSC and Department of Fisheries and Oceans. And the hearings are essentially very similar to the current hearing process.

One of the things that has changed under the *CEAA 2012* is that should the Commission consider referring this project to a Review Panel, under the *CEAA 2012*, the CNSC is solely responsible for conducting EA's for nuclear projects and so essentially you'd be referring the project back to yourself.

THE CHAIRMAN: Okay, thank you. Thank you for that. I think we're going to move on. Okay.

MEMBER VELSHI: I thought one of the other

differences of an EA Panel Review was it actually examined the need for any alternatives to the project which the screening level here doesn't do; is that correct?

MR. McALLISTER: Andrew McAllister, for the record.

At a screening level those would be at the discretion of the responsible authority. In this case for the refurbishment and environmental assessment as approved in the scoping information document by the Commission and consistent with previous refurbishment EA's, the need and the purpose and alternatives to were not included. It is a refurbishment project. But for panels in the previous -- the old *Canadian Environmental Assessment Act*, under one of the Section 16 factors, they did highlight that it could be other matters such as the need and the purpose; in the new *CEAA 2012*, that language is no longer there.

THE CHAIRMAN: Okay. Mr. Bertrand, you have the last word.

MR. BERTRAND: Thank you very much, Mr. President.

A note was handed to me and certainly an important point for a resident here is that the Saint Marys' Cement, the cement operation just down the road here, has applied to do some offshore drilling to access different grades of limestone. And there's one concern

that it may increase the seismic risk. And it's my concern under this process that the -- I think a previous intervenor mentioned silos, that various environmental risks are not really considered in a complete -- so I'm just wondering if the effects of this recent application -- I admit I only found out about it a few weeks ago and I was just reminded now; is it possible to consider offshore drilling from the Saint Marys' Quarry?

THE CHAIRMAN: So let me just say we discussed further explosion when you explore though you blow out some of the quarry ---

MEMBER McDILL: Blasting.

THE CHAIRMAN: Blasting, thank you for the word. That impact we discussed extensively yesterday, I believe, or the day before yesterday. Offshore -- just let me reply in the reverse.

If there was any issue impacting on the operation, I think staff they have to get -- they have to get a licence from Ontario government and staff would be involved. Please correct me if I'm wrong here.

MR. JAMMAL: Ramzi Jammal, for the record.

No, you are not wrong so any activity that will impact, with respect to the site itself, they must obtain approval from the CNSC but we can pass the question off to the OPG with respect to the offshore.

MR. TREMBLAY: Yeah, Pierre Tremblay. I'll get John Peters to answer that. Thank you.

MR. PETERS: John Peters, for the record.

This follows on a comment that I was asked to discuss earlier in the record and it is consistent with what I said then. The permit that the quarry operates under is issued by the Minister of Natural Resources. Any changes to that would require a consultation and an agreement with OPG because we have a formal agreement to certain kinds of vibrations coming from their operation at any time; that is monitored and reported. And they being our neighbour, we would be interested in confirming all of those facts as part of a process that they would be using to seek approval for whatever they are seeking to do.

And so this is an early stage in this project. We have no detailed information. I want to remind you that our EA does do a cumulative effects assessment and we have examined the quarry in its full extent as we know it today, and if there was a future change, that would be considered, again, through our licensing process and theirs.

THE CHAIRMAN: Okay, thank you. Mr. Bertrand?

MR. BERTRAND: Yes, just in response to some comments from OPG about the software for the control

for the man-machine interface as you term it. My question didn't have to do so much with the training of the operators but the ability of the software to accurately reflect the condition of the underlying system. It's basically a Fly-by-wire, if you want to use the aviation scheme or paradigm it's -- you have a lot of what's called the glass cockpit now which is basically just a computer screen displaying what normally would have been physical instruments, physical buttons, and so on. And the complexity of that user interface as you know from Microsoft Windows crashing, is of concern to me because it is not directly -- you know, as I said, I'm not disputing the safety shutdown system because that is a very deterministic system when the conditions are such, such and such an action is taken. But it's the underlying software that represents the system to the operator. So given accurate information I have no doubt that the operators will take the correct actions according to their training and their best judgment; that's not the problem. The problem is that link between the so-called glass cockpit and the rest of the system in behind the Fly-by-wire.

THE CHAIRMAN: Okay. You want to make a quick reply to this?

MR. ELLIOTT: Mark Elliott, for the record.

A couple of points I would make. The software for monitoring is also under a quality assurance program and there's a high degree of accuracy in the development of that software. So that what happens in the plant and is monitored by that software would be displayed to the operators in a highly reliable and accurate way.

We also have duplicate and triplicate measurements and displays in the control room; in other words, there may be three indications of the same parameter on one shutdown system, three on another shutdown system, three on a regulating system. And the operators have all of that information at their disposal and will make decisions based on what they see. So the instruments are accurate and there's quite a bit of redundancy should there be a problem.

THE CHAIRMAN: Okay, thank you.

MR. BERTRAND: Actually, I still have a follow-up question if you -- it has to do with, again, the software and the question of redundancy. Again, using the aviation, if you have a twin-engined aircraft, you have twice the chances of an engine failure. So redundancy really is -- it's seen as a panacea, but it brings its own baggage with it and that there's always a single point of failure no matter how much redundancy.

The other question had to do -- my other

comment had to do with embedded software, let’s say a programmable logic controller. It used to be a programmable logic controller was programmed with latter logic, basically relays, timers and so on. Now, a programmable logic controller uses embedded software and the actual latter logic program is actually an abstraction that the programmer would see on a screen and that abstraction would then be translated into machine code for the programmable logic controller.

My question is, is there a quality assurance program for the commercial off the shelf components, such as PLCs and other embedded devices that would be used in the -- in other words, does the quality assurance program extend to the suppliers to the station of -- well, for instance this microphone stand has a microprocessor in it. How do we know that the software running that microprocessor went through a quality assurance process?

THE CHAIRMAN: Okay.

MR. ELLIOTT: Mark Elliott, for the record.

The vendor software, software that’s embedded that comes from a vendor is handled under a different QA program, CSA 290.14 and it requires the vendor to meet certain requirements and it requires OPG to check on those requirements that they’re met and if

there’s any gaps, to address those gaps before the equipment in installed.

And just a follow-up point on your latter logic. As part of our acceptance of that design, we would get out of the programmable logic controller, we would get all that logic and we would review it ourselves before we would accept that vendor software.

THE CHAIRMAN: Okay, we’ve got to move on. Thank you, Mr. Bertrand.

MR. BERTRAND: Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: We’ll move to the next submission, which is an oral presentation from Mr. Guettel, as outlined in CMD H-13.138 and .138A. Please proceed.

12-H13.138 / 12-H13.138A
Oral presentation by
Alan Guettel

MR. GUETTEL: Thank you. I’d like to thank the Commission for giving us this chance. I’ve really learned a lot through this process, preparing this and listening to the other presenters and the questions.

I’m Alan Guettel, just a retiree.

I used to have a real us-versus-them attitude about politics, public works, corporations, government but as a recent retiree, I look at my financial wellbeing and I find out that I'm up to my neck in "them".

My CBC pension fund that pays me about $1400 a month, my Canada Pension which will soon pay me $1000 a month, along with my RRSP and cash mutual funds with names like Harmony and Fidelity, altogether tying into a lot of big energy; coal, oil, gas, nuclear power. Those same pension funds also hold a lot of Ontario's debt, which finances things like expanding nuclear energy.

Billions of dollars. I mean the CPP in its first line has $12 billion of Ontario bonds when you look at the website, its assets. That's a lot of money.

I also have to declare I own $3300 worth of shares in a clean energy firm, called Algonquin Power, an investment that started out as one of those $5000 RRSP labour-sponsored venture, capital funds that the province used to support. It gave me, in fact, gave me $1500 tax free to do it. That program went caplouee and went down to about $1000. It got turned into an equity stock and Algonquin's done a good job, they brought it back to almost what it was worth ten years ago.

As a CBC producer I was a leader in a special edition of the program, "Dispatches" called

“Nuclear Renaissance” which won the broadcast industry’s best radio or TV program a few years ago, the Peter Gzowski award. Pro and anti-nuke people alike criticized it for coming down right on the fence about the future; grave dangers, great costs, wonderful promises. But that’s the point I guess why we’re all here today.

I have other interests than this. I pay about $1200 a year in electricity bills before taxes. That includes about $60.00 toward retiring past debts of Ontario Hydro and I still call it hydro, sort of as a generic term. $60.00 on which it appears that I also pay HST. But the debts, those are big debts, something like $30 billion that includes unfunded liabilities and I love the term “stranded debt” from the break-up of the old hydro system.

Ironically through my pension funds, et cetera I’m making money by holding some of that debt, except in this case I pay income taxes on the money hydro pays me back through the funds and pension cheques, after paying HST on handing it back to hydro in the first place.

So I’m totally wound up in the future and the past of Ontario’s hydro system, the whole electricity system with all kinds of reasons to care about how billions of dollars are going to be spent on Darlington, or not.

I’m an electricity consumer who makes an effort to keep hydro bills down. There are millions of us in Ontario. We volunteer in peak-saver and peak-saver plus, but Toronto Hydro can remotely turn down our air conditioning in a heat wave.

We do dishes and laundry during lowest rate off-peak hours and it saves us a few dollars a week. Even occasionally we check our hourly use records on the internet, and just this fall we received our power cost monitor that we place over our TV, and just at a glance at any time we can see whether we’re burning 3 or 8 or 12 cents an hour worth of electricity. That’s about 60 percent of the total cost I figured out when I looked at my bill and it took me to figure out all the debt repayment regulation fees and taxes.

So just by reading our hydro bills, I’ve learned a lot about the Ontario electrical system and about us, my wife and me. In the winter we use about five or six times as much electricity in the lowest off-peak period at night and on the weekends than we do in the highest peak period. In the hottest months it goes down to about three times as much consumption in the lowest off-peak periods than in the highest periods.

Now you have to bear with me. These nickels and dimes started adding up and then start to make

a point. We've really cut down on our electricity consumption over the years, back in 12,000 to 14,000 kilowatt hours for each of the eight years between 1997 when we opened our current account and 2004. Then there's a sharp drop to 10,000 kilowatt hours in 2005 and a steady decline to about 7500 in the four years leading up to 2009. That's a drop of 51 percent since '90s. We cut our consumption in half.

There's a little bit of a lifestyle after we retired, it went up a little but we're about normal people; we're just regular people.

In December 2008, which is the earliest bill I still have in my drawer, we paid 7.69 cents per kilowatt hour when you calculate all the fees and the taxes. This year that's going up to 14.9 cents; that's up 94 percent in two years, including HST and so on. But most of that happened in the first two years.

We paid 14.5 cents per kilowatt hour in May of 2010, the first time we were billed in time-of-use rates and then 14.6 cents on the next billing when HST was applied. So in two-and-a-half years, since time-of-use billing, what we paid per kilowatt hour has only gone up 2 percent, which is like well below inflation, and that includes the 8 percent hit with the HST.

So it starts to make a picture. Most

months we hang our laundry outdoors, that's even though our electricity savings at about a dime or two saved per wash load hung up; we call that WHU. About 50 cents a week for about 30 weeks a year, it'll never get back the 79.99 we paid for the clothesline contraption, especially after the 39.99 one broke down, plus taxes.

Canadian Tire, you know, and government with its 13 percent sales tax up front probably did better than we will.

Our home has a high efficiency gas furnace, tankless water heater. I wish I could supplement some of that with wind or solar energy.

Yeah, and this is what really hurts. I read that when we do save a nickel or a dime's worth of electricity from the provincial power pool, it's a burden on the system. The guys at Ontario Power Generation are thinking in numbers like millions and billions and trillions have to waste time spending thousands and hundreds to get rid of that tiny bit of energy that activist consumers don't consume. They have to pay customers outside of Ontario to take it. That really hurts. I mean the argument they make is that nuclear plants run like only at full tilt and it's slowing them like down as something like parallel parking a super tanker in a storm.

But just like peak-saver in reverse, couldn’t they figure out a way to bump some of that extra electricity into my home or offer it to community non-profits or something.

Now these same guys come back and ask each of us to cough up our share of another bunch of billions to generate huge priorities that will make our efforts seem pointless.

For the record, I share the environmental safety and financial concerns of many experts and fellow citizens who are making their cases in these hearings.

What I want to protest is overarching attitude of this costly process for setting priorities that nuclear power seems to require. What it tells us is that our efforts, our personal financial and household research, how far we go to make new alternatives work, are insignificant, even inconvenient to Ontario Power Generation.

I admit I want locally produced energy. I want made in Ontario energy. I think my provincial government and I agree on that, and I also want more electricity. I want electric cars and bikes, electric mass transit and high-speed trains, electric home heating and hot water, heated swimming pools and air conditioned classrooms and more ice rinks for kids. I want the

natural gas powered heating in my home to switch to clean, cheap locally produced electricity in off peak hours, cheap rates to recharge an electric car at night. I want neighbourhoods to generate heat and air conditioning from the ground under the streets. These are all ideas that are out there. They're not pipe dreams.

We can start by trying to figure out how to make some of these things happen, concrete examples, pilot projects, and the proposal to expand Darlington doesn't provide any of that. It makes alternatives look puny and people appear powerless, and locking it in until 2055 or something like that means several generations will be stuck with this expensive priority or lose billions.

I remember the early days of garbage recycling in Toronto when we took our cans and bottles down to a depot run by Pollution Probe, and it took only a few years and a lot of noise and meetings and the City finally set up a few of its own select depots, and another few years for a voluntary program where some garbage trucks came by sometimes, picked up some bottles, sometimes in some neighbourhoods.

Who would have thought that 30 or 40 years later households are routinely separating compost and recycling and paying for pickup? I mean, people go a long way to try to do the right things, I think.

The decision to expand Darlington is one more giant step away from the millions of baby steps we need to make something comparable for that happen in ways that households and industries generate and consume energy.

Those millions of baby steps would have even more positive impact than the garbage scenario and the process would serve as a model for so many other efforts that require enlightened leadership, citizen input, and household efforts.

What an opportunity for several generations to experiment to find better ways to do things, to innovate, instead of having to pay off the debt from expanding the Darlington project now.

THE CHAIRMAN: Thank you. Questions?

I just have a comment. I think CBC probably misses you. That was very entertaining.

Thank you.

MR. GUETTEL: They cancelled my program.

THE CHAIRMAN: Thank you for this. Thank you for that, okay.

I'd like to move to the next submission, which is an oral presentation by Mr. Kehoe, as outlined in CMD H13.140. Please proceed.

12-H13.140

Oral Presentation by

A. J. Kehoe

MR. KEHOE: I should set my watch because I only have 10 minutes, so there we go. Timer, start.

My name is A. J. Kehoe. I spent over 10 years working as an IT modernization specialist. I'm responsible for maintaining and securing over 300 internet-connected servers across Canada. My job requires me to spend a great deal of time studying security, evaluating risk, and implementing safeguards.

The Darlington Nuclear Generating Station never should have been built. It is too close to a densely populated area worth many billions of dollars and the area's population and property values will only increase. Exacerbating this problem is the woefully insufficient infrastructure required to accommodate a mass evacuation.

Ontario's Provincial Nuclear Emergency Response Plan is so vague and inaccurate that it's scorned as rubbish by people who are expected to take it seriously.

A police traffic operations commander I spoke to described it as asinine and he said that it would

be as successful as trying to herd cats.

If Darlington suffers a catastrophic failure, what will we do? As far as I know, we don't have a backup Toronto and Ontario standing by to replace our current Toronto and Ontario. I haven't seen any 1,640 cubic kilometre freshwater reservoirs lying around that we could use to replace Lake Ontario. My insurance company won't cover me in the event of a nuclear meltdown, and according to *Canada's Nuclear Liability Act*, OPG won't be liable for any more than $75 million.

Don't believe for a moment that Canada is immune to nuclear disasters. Our technology and geography may be different, but there are still countless factors that could result in catastrophic destruction, and OPG's cavalier arrogance isn't helping.

The reactors at Darlington may have safety features, but like all human creations, these safety features can and do fail.

When studying security, one of the first things you learn is that a determined attacker with sufficient resources will find a way to inflict damage.

Emergency response and disaster mitigation are therefore very important and planning requires an understanding of a worst-case scenario.

Like any electricity generating station,

nuclear plants have many potential attack factors. The attacker could manipulate staff or contractors to make them do dangerous things, disrupt or corrupt the fuel supply, cut off electricity transmission towers, crash an airplane into the power plant. There are countless other ways to precipitate a disaster.

A defender must counter every possible attack, whereas the attacker needs to succeed only once. Even an attack that poses no real risk of disaster can be considered a successful attack if it prompts operators to shut down the reactors. False positives that lead to shut down are far more likely than any real attack. It costs a lot of money and time to stop and start nuclear reactors and the effect of this on the power grid can be very problematic.

A major vulnerability in the security of our nuclear plants is their use of Microsoft Operating Systems. Microsoft Windows is a notoriously insecure operating system that is routinely infected by malicious software, including a recent virus that specifically targeted nuclear power plants.

It astounds me that our nuclear operators would choose to use something so insecure and unreliable when there are vastly superior and more secure alternatives available like the open BSD Operating System.

Security is like an onion. It has many layers and it makes you cry. Securing the mission of critical systems is a start, but what about all the non-critical systems? For example, if an attacker exploits a vulnerability in OPG's Microsoft email server or their Microsoft web server, they could spew out copious amounts of false information to employees and/or the public. Microsoft Windows and closed-source software in general have no place inside something as critical as a nuclear power plant.

Nuclear power generates excessive amounts of pollution. The mining and processing of nuclear fuel produces millions of tonnes of waste emissions. In areas that host nuclear plants ambient radiation levels are several times higher than what you'll find elsewhere.

It's fascinating to roam around Durham Region with a Geiger counter and compare its readings with other parts of the province.

Every year, Darlington's once through cooling method kills millions of fish and other wildlife. Lake Ontario is the source of our drinking water and the concentrations of tritium discharged into it are many times higher than what occurs naturally. Nuclear waste will remain radioactive and hazardous for thousands of years and will -- needs to be guarded for all that time.

This will be our expensive and cruel legacy to hundreds of future generations, which is probably more lifetimes than anybody can comprehend. All of this pollution exposes us to radiation unnecessarily. Like mercury, lead, poison, fire, dioxins, furans, and bullets, radiation is one of those things that has no safe level when it comes to interaction with the human body.

There's a billboard at Darlington that reads "Nuclear Energy Equals Clean Air". This is a false information, but I guess it depends on your definition of clean air. If you define air that is clear and odourless as clean, then I guess carbon monoxide is also clean air.

There are alternatives to nuclear power that aren't remotely as dangerous and that don't produce nearly as much pollution.

For example, a large array of wind turbines can produce more electricity than a nuclear plant. The catastrophic failure of a wind turbine or a solar panel would be limited to the local environment and wouldn't release radioactive pollution.

To get a few more decades of risky and dirty nuclear power, Ontario is planning to spend an estimated $36 billion to upgrade Darlington. For less than $9 billion we'd get the same 4,400 megawatt hours capacity from wind power. With the $27 billion dollars we

have left over, we could install solar panels on the roofs of over two million homes and retrofit every home in the province to be more energy efficient.

(APPLAUSE/APPLAUDISSEMENT)

For a company wanting to set up a factory, they might be deterred by their insurance company's lack of coverage for nuclear meltdowns. A company may also be scared away by ambient radiation levels or by how heavily we are relying on nuclear power versus other places.

Google and other heavy electricity users have been making non-trivial investments in renewable energy to reduce their costs and to appease consumer pressure.

In 2012 on this planet, there is no rational reason to choose nuclear over renewables. Germany, Belgium, Switzerland, Japan and Quebec have all decided to abandon nuclear power and the world’s renewable energy production is growing rapidly.

Two years ago, Germany, which is less then a third of Ontario’s size, produced over four times the amount of wind power that all of Canada generated during the same year. Germany’s population and density are much higher than Ontario's, but most of Ontario’s population lives in an area that has much higher density then all of Germany.

It’s very easy to predict when solar panels will be producing electricity. Hydro electricity is also quite predicable and reliable. Wind power fluctuates wildly, so our power grid will need to be adapted to beat these variances. Countries with electricity demands that are much higher then ours have adapted their grids to support these frequent fluctuations, so we can too.

There was a time when people believed that the world was flat and was the center of the universe. There is a time when people believed that the world had an inexhaustible supply of African elephant tusks. There was a time when people believed that smoking was a healthy and glamorous activity. And there was a time when people believed that nuclear fission was a clean, safe, and cheap form of electricity production.

It’s easy to see how people who work in and around the nuclear industry can be brainwashed into believing the myths that nuclear power is clean, safe, and cheap. They start by attending expensive schools where they are surrounded by eager students studying nuclear power, and they are taught are by people who are labelled experts on the subject. They spent years in these environments having their fertile minds implanted with the myths that the nuclear culture perpetuates. Once they’re done school they head off to established nuclear

institutions where they are surrounded by fellow worker drones who are also paid handsomely for their knowledge and skills. The steady pay cheques and sense of achievement cement their belief in the nuclear myths and they become proponents of nuclear power, thus enticing more people to pursue careers in the nuclear industry.

I was born and grew up in Durham region. As a child, I remember bringing a form home from school, asking a parent or guardian for consent to give me potassium iodide pills in the event of a nuclear disaster. This cannot have a positive psychological impact on our children. I plan to continue living for another 60 years. Nuclear power poses a very real threat to the physical and financial health of me and the rest of the planet. And this threat will continue until the last nuclear power plant is finally shut down.

For the long term benefits, long term well-being of my friends and customers who work at OPG nuclear plants. And for everyone else on the spinning blue marble, this untendered pillaging of our future must be stopped.

(APPLAUSE/APLAUDISSEMENTS)

I ask the CNSC to do five things. Number 1, close Darlington Nuclear Generating Station; number 2, order OPG to stop advertising nuclear power as clean,

safe, or cheap; number 3, order all nuclear facilities to stop using Microsoft windows and closure software; number 4, fix the problem that prevents the CNSC from reading digitally signed email. I've offered my professional assistance at no charge to the CNSC IT department, but they won't reply let alone fix it. This inhibits public communication with the CNSC; and 5, stop forcing the public to depend on closed source and proprietary software to view your web casts. We have alternatives that are much safer, much cleaner, and much cheaper than nuclear power; let's get started on our renewable future so that Darlington and the nuclear industry can switch off in the glow of our sustainable light.

THE CHAIRMAN: Thank you, very entertaining. Okay any question? Sorry.

MEMBER McDILL: I think we have to address the Microsoft issue. And maybe the electronic signatures also?

MR. TREMBLAY: All right I'll ask Mark Elliot to talk about our software for – yup, deal with that issue.

MR. ELLIOT: As I mentioned earlier in the day – it's Mark Elliot for the record.

Our shut down system software and our regulating software are OPG designed and developed in

house. They are maintained by OPG staff and use our own system and are not subject to the concerns that the intervener is raising.

MR. KEHOE: My name is AJ and actually the issue is that you don't have access to the source code for all the software that you're running. So you don't have access to the source code to the secondary software. You are using Microsoft Windows at your nuclear plants and if you do have access to the source code, can you please share it with us so we can all audit it to verify that it is actually secure? And reliable?

MR. MCBRIDE: For the record, Dennis McBride, I'm the director of security and emergency services programs at Ontario Power Generation. With regard to the interveners request that we share the source code, I think that that would be a security breach in and of itself.

MR. KEHOE: Really? Its strange because the open BSB operating system which is regarded as the most secure operating system in the world which receives funding from DARPA in the United States which is a military organization and they also have their SSH client which I'm sure must be used at least somewhere in your organization. It is an open source project, they release their source code to the world because they believe that

by showing it to the world people can look at it, review it, and verify that it is indeed secure software. People – anybody in the world can download it, look at it and say yes, here’s a problem lets fix it. By closing it, you are preventing us from doing that. You’re preventing a public audit of your software. This is a problem, this is the problem, this is why Microsoft has all these little vulnerabilities. If they were willing to share it, I’m sure the general public would be willing to assist them in making it better. But – sorry the Open SD operating system as it stands has had two remotely explodable vulnerabilities in the past something like 15 years. Microsoft has dozens every month, look at how many security patches they send out on any given update. So you need to stop using Microsoft software and closed source software.

THE CHAIRMAN: Okay listen, you heard you say i'll let him reply to your outburst.

MR. KEHOE: Understood, I just have a quick – just a way to try to an analogy for him. So you can look at your nuclear reactors and you can point at it and you can say I like this, I like this, I like this, I like that. And so therefore you can release this to the public and show us that yes, your hardware is secure. But the software is kind of the same thing. We want to verify

that those systems are also secure. So this would make me feel a lot better if I can audit your code for free, I'll do it for free. And so sorry, go ahead I'll let you talk now.

MR. McBRIDE: I think all I'll say in response is that we separate our real time software that operates our reactor and protects our reactor from the other software that the intervener is speaking about.

MEMBER McDILL: Thank you, since AJ gave us permission to use his first name, when we refer to the intervener as the intervener there is no disrespect in title that were entailed. It's simply that, you know my mom brought me up to call people by their first and last names only when given permission. Either Mr. Kehoe or AJ. Can we talk about the electronic signature? I realize this is just a niggly little thing, but I think maybe it would be of help for other interveners who perhaps want to submit electronically or digitally even if it is a PDF file or something like that.

MR. KEHOE: So email is as secure as sending a post card. Anybody can intercept and modify and read a message as it is being transmitted, unencrypted across the wild frontiers of the open Internet. When technical problem arises that might cause the original message to be distorted. So lets say that there's some

sort of a glitch somewhere and it causes the message to be distorted, some word gets changed, some big content gets changed, maybe a picture gets mixed in or something like that. Digital signatures allow you - and it is a standard, look up S-MIME, S slash M-I-M-E, it’s a global Internet standard. In fact it is the standard for digitally signing email. It allows you to verify the message has not been modified since it was sent. So it’s the strange bizarre problem that I actually had while trying to contact Louise. Forgive me, I forget your last name, but she said that she wasn’t able to open it up in her email program. And that to me is very bizarre; I’ve never had this problem with anybody else. And what – I’m not sure what makes the CNSC different in that regard, but what I did is I offered my assistance for free to your IT department and they wouldn’t even reply, let alone actually fix the problem. And Louise still can’t read my messages. So what’s wrong with your IT department?

THE CHAIRMAN: Nothing, it's perfectly fine, and this is the first time I hear you have a problem with -- I open up all kinds of emails, so we will figure out what is the problem.

I can assure you that we're corresponding with all the intervenors online, and we -- that's the first time I hear there's that kind of a problem, so we

will follow up on that.

MEMBER McDILL: But A.J., you can appreciate from a security point of view that someone volunteering to look into the software for free might be perceived by a number of people as a potential uninvited threat.

MR. KEHOE: Well, you're welcome to audit my practices. I invite it. I'd like everybody, if they'd like, to watch me talking on the phone telling them what to do and how they can go about it, and feel free.

Audit it. If there's a problem, let me know.

MEMBER McDILL: You can understand the concern why ---

THE CHAIRMAN: We will never let you audit our system, okay. Just get that through your head, and I don't understand what other company will ever allow you. Forget about nuclear. Any other government operation, we got hacked in the Government of Canada. I -- you know, they would never allow you to come in and audit their system, security people.

MR. KEHOE: I actually know people that have audited their systems and found a lot of issues with it.

THE CHAIRMAN: Yeah, our internal security

people will do that.

MR. KEHOE: Okay. These are the same ones that don't understand the difference between digital encryption and digital signatures.

THE CHAIRMAN: We understand perfectly well.

MR. KEHOE: Okay. Okay.

THE CHAIRMAN: Thank you very much.

MR. KEHOE: Oh, I have a closing statement as well.

And that is, this is the one -- I wanted just to point out just for your own benefit that this is a wonderful opportunity for the CNSC to demonstrate that they are not spineless subsidiary of OPG.

By closing Darlington, the CNSC will send a very strong message that they are not public -- that they are not puppets of the nuclear industry because as it seems to me, I just sort of picture that instead of spines you actually have arms that have been forced up your rectums and is controlling you like puppets, which I think is actually what is meant by the term arm's length regulator.

But anyway, thanks for your time. I look forward to you ---

THE CHAIRMAN: Thank you.

MR. KEHOE: I look forward to you shutting down this expensive, dangerous and filthy monstrosity that never should have been built.

THE CHAIRMAN: Thank you.

The next submission is an oral presentation by Mr. Blaney as outlined in CMD H13.151 and 13.151A.

12-H13.151 / 12-H13.151A

Oral presentation by

Brad Blaney

MR. BLANEY: Okay. I'm here to speak to -- as a businessman and taxpayer from Ontario.

I was fortunate enough to be born in the nuclear -- during the nuclear dream, but over the years I started to read some of these -- the Ontario budget and started to ask some questions over the last year or so, and I'm -- and as a result of a discussion I had with my MPP, David Zimmer, I realized that we needed to spend more time reading what our politicians were doing and reading more about what you were doing and OPG was doing.

You know, unfortunately, you know, a lot of people here today have been explaining a lot of things that I, quite frankly, should have read in either the OPG business case to renew the Darlington plant or in your

summaries of their report and your review and analysis. But unfortunately, all I got was a lot of, you know, not significant, and quite frankly, I just can't buy that.

Now, unfortunately, really, now that I've realized what's happened since March 2011 is that we're really just presiding over a cadaver. You know, the commercial nuclear power industry, for all intents and purposes, is dead.

It'll probably take just as long to kill it as it did to bring it online. I don't think -- and it's not a Chernobyl issue, you know, that we blame the Russians for Chernobyl. The fact is, you're dealing with a state of the art plant, fifth-largest one in the world, in Japan and, you know, as a result of a combination of factors, not the least of which was a major seismic action, you know, you have a destruction of the fifth-largest nuclear power plant in the world.

Today, after over 600 days consistently leaking radioactive materials into the Pacific Ocean, it's hard to believe that in the OPG annual report Sir Jake Epp reported that this was an event.

Now, this is a three core meltdown. These things are going -- the plants themselves are in excess of 45, 50 year old concrete structures. They are porous. They are leaking into the basement.

You know, the fact that, you know, the soft music is that it is an event, it's not an event. It's the worst manmade nuclear -- the worst manmade disaster in our history, and it will be going on for, likely, you know, if we're lucky, decades, you know, if we're unlucky, centuries.

The technology does not exist to remediate most of the problems. About the best thing we can hope for is that they'll continue -- the Japanese will continue to pump millions of gallons of water into the reactor cores until they -- and keep them cool until they get cool -- until the point at which they are no longer too hot to work near, and that could be, you know, 20, 30 years, maybe longer.

But you know, the -- and some people wonder why, you know, why that's a timeline. It either happened on March 11th when we knew that there was a disaster or it was June 11th when the Japanese and TEPCO and the NERC and all the other regulatory bodies finally admitted what really happened, you know.

So regardless, you know, the women of Japan are going to take care of it. There's an election on December 16th and there's some ass kicking going to be done. And I'll tell you right now, the women of Japan, they're not going to allow their children be exposed to

this stuff and they're going to kick every one of these deadbeats out.

And then, like all politicians, because this is Ontario, it is truly a trilateral -- or tripartisan thing. I have spoken to every party.

They couldn't -- they are so pro nuclear, I think they got -- I think they got OPG tattooed on their ass.

Bottom line is, is they are not -- pure and simple, they are not moved to doing anything. Every one, NDP, Progressive Conservatives, Liberal, they're all the same.

So the Japanese are going to go through a place where the politicians lie to these women and then they're going to do what they normally do and try to reopen it, but that's -- it's over.

And unfortunately, the political price is going to be paid by politicians who have been bought and paid for by the nuclear industry, and it's now we're going to call upon the women of this country and everybody else, you know, to do the same thing and bring the message to the politicians.

That is -- you know, and that's very important. The -- you know, there's -- there is no reason, you know, for -- there is no cost justification to

these plants.

If you look at our -- if you look at everything we're talking about here, primarily it's borrowed money. And the money that's going to be done to retrofit this thing, it could either be 15 billion, it could be 30 billion. They could find out that, you know, they screwed up a pipe and it could be another two years.

There is no guarantees that this thing will ever be finished on budget or be safe to operate afterwards.

Now, in favour of the people who work for OPG who are sitting there making -- I've seen the sunshine list. I mean, it's -- it blows your mind. I can understand it. I used to make a lot of money. I know what happens. It compromises your ethics a bit.

But the bottom line is, is that don't worry. You're going to be babysitting these plants for the next 150 years. This is jobs for life for life for life. Even if you turn them off right now, you're going to be there for at least 100 years.

So you know, you've got jobs for your kids, you know.

The -- you know, but you know, like many funerals -- and it's so nice that this is held in a church and we're at a funeral, you know, that this is the death -

- the death of the industry is happening. And everybody wakes up in the morning and goes, "Oh, God, I wish it was -- you know, I wish it was yesterday and I wish everybody was alive, you know".

But it isn't. Wake up tomorrow, everything's not going to be the same. It's over, you know.

And you can -- I wish people would, you know -- and I’m sure all you people at OPG and all that are, you know, well-meaning family people and all that. But -- and it's tough when you're making all this money to -- you know, to bring these arguments to these lovely people who are, in turn, you know, basically -- you know, basically political party appointees whose job it is is to make sure that the special interests in this group -- and this is a big industry.

There's -- you cannot compare this to any other industry because it -- unlike the oil industry, which is probably a similar structure, this is all public money. None of this -- it's -- the closest example to the nuclear power industry that I come to think about is the professional sports franchise business.

The only -- there is no justification to build a $1.5 billion sports facility. No -- the Dallas Cowboys can go ahead and attempt to build a facility, but

the bottom line is they're not going to invest the $1.5 billion. They're going to go to the city and they're going to say give us the money, we're going to have a sports facility, here's what we're going to do, we're going to manage it, we're going to bring in the talent, and you're going to pay us, and we're not going to pay any taxes you know, and what we're going to provide is local jobs and that type of thing.

It's pretty attractive. But this business model -- the moment you bring in and forget all the stuff about the waste and waste management. The bottom line is you bring in the stuff that -- you bring in the stuff that's simply related to carrying this debt. There's nobody on Wall Street that would invest a dime you know.

The -- you know, Michael you noted what student intervenor in a group that -- you know, that they actually indicated that 78 percent of the youth poll did not even know about the plans for retrofit. And you know, the ignorance of basically our general population. I mean I had to kick my ass to go out and get into this stuff. But you know, I'm glad. That's the only favour David Zimmer did for me was get my ass in gear and start reading this stuff. And you know but the fact is Fukushima Daiichi because of the globalized, contemporized media blackout. There is no -- the similar dull population had

no idea about what's going on you know, at these facilities right now. The workers, we had yesterday Bob Walker from the Ontario Power Workers Group, you know he was saying this is a great, safe situation where we can hardly wait to get to the plant. Mother of God, don't ever go near the plant. Okay. You know old white people like me might be able to do it but don't bring anybody young near there. You know, the bottom line is it's a contamination of the level that is beyond comprehension.

And the Japanese government and the NRC are lying to everybody about it. And you know what? The Japanese people, especially the women are going to settle the score. You know, the OPG's business plan, they're weak on details about threats, strong on benefits for stakeholders such as the politicians, the employees and corporations dependent on this taxpayer funded project for their meals. Bottom line is that there's a lot of people at the council, you guys are all well-meaning -- you know there's a huge budget for the CNSC. I understand Mr. Binder, you have been appointed for another five years. You know, I guess nobody's congratulated you. I'm going to. I'm hoping that you'll have the leadership to basically say no to this proposition. And -- but I've also got to think when I look at the CSNC response to OPG, I mean even -- for example the councillor that just came

in here recently who was saying yeah, we're still a little concerned about the possibility of traffic and all this dust and all this coming forward. The bottom line is I read your review. It said this is not significant. Well, it is significant. If you disturb that plant property and dig it up, it's been sitting there for 30 odd years. And what are you going to do? Use water to keep the dust down, spray to keep the dust down. That's going to go into Lake Ontario. There's no possible way you can mitigate that potential exposure. So you've got to go back and tackle this report. And the other -- excuse me, one more sir -- the other thing I brought in, another one I don't know if I can go to the next one just quickly. That's my sales commission one which I think is you know a little bit -- but the Ombudsman report on the 200 Wellesley Street fire, if you ever want to read a report about any emergency planning stuff, you have to read the Ombudsman report about this.

This is one building where a guy had a hundred books -- thousands of books in his place and it started a fire and burned basically a core of the building rendering it structurally unsound. Twenty-five hundred residents. This thing is such a disaster nobody even knows. You know, they're still trying to deal with these people.

THE CHAIRMAN: We read your submission. So thank you for that. And thank you for your presentation. Anybody have a question? Question?

Thank you. Thank you very much. We will take a break; we'll be back at 10 to five. Thank you.

--- Upon recessing at 4:36 p.m./
L'audience est suspendue à 16h36
--- Upon resuming at 4:51 p.m./
L'audience est reprise à 16h51

THE CHAIRMAN: Okay. We are ready to continue. And the next submission is an oral presentation from Ms. McNeill as outlined in CMD 12-H13.153. Ms. McNeill the floor is yours.

12-H13.153
Oral presentation by
Janet McNeill

MS. MCNEILL: I'm not sure how -- oh, I'm close enough, right? It's okay?

Good afternoon everyone. I'm a mother, environmental activist and writer and have spent most of my adult life in the Durham region. I did spend several

years actually living in Deep River and there are things I'd love to add about my experiences dealing with SRB up in Pembroke, but I don't have time with the limit -- the time limit.

I'm not an expert on nuclear technology. And I'm a passionate believer in telling the truth. I've actually borrowed this sign off the church wall here. It was on the wall by the bathroom and it says: We tell the truth no matter what. So I promise to tell the truth and then I promise to put back the sign where I got it from.

One thing I've learned the hard way is that so-called experts cannot always be trusted. Dr. John Gofman who worked on the Manhattan Project and helped isolate the world's first milligram of plutonium understood this well. Dr. Gofman who had both a PhD and an MD later bailed from the nuclear scene and became passionately anti-nuclear. He once said: "My particular combination of scientific credentials is very handy in the nuclear controversies, but advanced degrees confer no special expertise in either common sense or morality." (As read) That's why many laymen are better qualified to judge nuclear power than the so-called expert.

He put in his book, Irrevy: An Irreverent Illustrated View of Nuclear Power, a personal apology for not having clued-in on nuclear risks sooner. He said:

“There is no way I can justify my failure to help sound an alarm over these activities many years sooner than I did.” (As read) And even added that he feels many scientists are “candidates for Nuremberg-type trials for crimes against humanity.” (As read)

As my written submission stated, though there are many aspects of nuclear energy on which I could focus and I forgot to list weapons proliferation in that list, I’m focussing my remarks on waste. Activists have been saying for decades now: It’s the waste stupid.

Nuclear waste is so long-lived, none of us can really even get our head around the lengths of time involved. Everyone in this room knows this. Although quite a few in very expensive suits pretend otherwise. This mug that I bought last weekend at a Chicago conference about nuclear waste says: A mountain of waste 70 years high and we still don’t know what to do with the first cupful. This is very true. Just ask the people from Port Hope.

In September last year, exactly six months into the Fukushima nuclear disaster, I attended a nuclear industry conference called: Waste management, decommissioning and environmental restoration for Canada’s nuclear activities, that was held in Toronto. For the record I attended at my own expense. No one paid my

conference fee or any of my expenses. No one is paying me to be here either. Three days with the nuclear industry proved to be quite enlightening. I heard it hammered home repeatedly that nuclear reactor refurbishments create considerable amounts of new nuclear waste. The summary of OPG head honcho Tom Mitchell's talk -- Mr. Mitchell's annual salary by the way is $1.8 million. The summary of his talk states, "the amount of nuclear waste in the world is expected to grow due to refurbishments, new build activity and the decommissioning of reactors." (As read) Mitchell said Fukushima was a humbling experience that showed the unthinkable can happen. He also said there is an unfounded but perceived fear of radiation. I wondered at the time if Mr. Mitchell would care to remove used fuel rods from a reactor with his bare hands, but somehow doubted it.

Mark Corey, Assistant Deputy Minister, Energy Sector, Natural Resources Canada, spoke about uranium wastes in the Bancroft area. And then commented in reference to the Chalk River Facility. We are finding things as we go along that we hadn't quite expected. This was later alluded to by Chalk River's Joan Miller, who spoke of significant learning lessons and some things that, quote, "were probably thought to be pretty clean in the 1960s and left in the environment for storage."

Christine Fahey from the Port Hope Area Initiative -- sounds kind of like an arena building project or something, but it's not -- spoke tearfully about her organization's access to millions of Canadian taxpayers' dollars to clean up the shameful mess left in Port Hope, and then said with a straight face, "They are leaving an honourable legacy."

Most Canadians are perhaps not familiar with the industry's use of created language -- creative language. Old waste is called historical or legacy, as though this will miraculously neutralize it. We, taxpayers, wind up with custody of these wastes, basically, and are paying millions or billions of dollars to handle them. The industry reaps the profits, we get the wastes and the costs. I've never quite been able to figure it out.

Some other interesting things from the September, 2011 conference. Dr. Binder, CNSC's President, commented that obviously the March 11th event in Japan was a wake-up call. He also admitted to the 99 percent industry crowd, we have tended -- quotes -- "We have tended to be secretive. Most of our conferences are us talking to ourselves, not the public, not the press." End quotes. He sped very quickly through the slides that show the sites of nuclear waste in Canada. One of the slides

said, “Must reassess everything nuclear, including waste.”

In response to some Q & A after OPG head honcho Tom Mitchell spoke, Mr. Binder commented, “Beyond-design basis issues will have to be dealt with.” Two more gentlemen added to my understanding about the quantities of nuclear waste created by refurbishments. Charles Hickman, from NB Power Nuclear, admitted, Point Lepreau -- I’m quoting -- “Point Lepreau Generating Station has been challenged during the outage due to the amount of low- and intermediate-level waste that has been generated compared to that which was expected, which has driven the need to develop a new waste management strategy in the middle of the outage." And went on to explain that the quantity of waste has proven to be so great that some will be sent to Tennessee for incineration -- the ash to be returned here.

I shudder for all of us thinking about the burning of nuclear waste, wherever this happens, to take place.

Francois Bilodeau, from Hydro Quebec, stunned many of us, I think, with his revelation that the planned refurbishment at Gentilly-2 would have created five times the amount of waste that they already had on site. Since the conference, of course, it’s been announced that this plant is to be shut down. They will now have their hands quite full decommissioning it.

Which reminds me of another speaker, Keith Peecock from NASA, who worked on decommissioning the Plum Brook Reactor Facility in Ohio; a test reactor, I think. This took 12 years and cost $250 million to clean up. It had cost 5 million to build, 250 million to decommission. Yikes. I'd noticed his reference to blending. I believe this is nuke speak for mixing together different categories of nuclear waste, finding creative ways to dispose of it.

In a virtually incomprehensible workshop on the new CSA guideline, a Mr. M. Rhodes used at least one phrase that aroused my suspicions: unconditional clearance criteria. After an utterly baffling talk, something did become clear. When asked about the public consultation that had been done before the new guideline was established, he replied that it had been put on the Canadian Standards Association website. I guess this is what the nuclear industry conceives of as public consultation. Why meet with actual members of the fractious public if you don't have to?

It seems the nuclear industry has entered the age of nuclear waste. With plans to keep making it, burn it, export it, free release it, allow it into consumer products -- radioactive cutlery anyone? -- transport it hither and yon, endangering waterways and

people at every turn. Although Pauline Witzke of OPG, in speaking of planning for a deep geological repository, did make the statement that transportation risk is quite high.

Well, you seem to be saying over and over and over again here at this hearing, “Just trust us.” But the truth is, the more you talk, the less we trust you.

(APPLAUSE/APPLAUDISSEMENTS)

MS. McNEILL: And the more experience we get, in my case as with SRB in Pembroke and SSI in Peterborough and Port Hope in proposed shipments of radioactive steam generators, and this business of $75 million nuclear liability -- meaning that taxpayers foot the bill if one of those darn nuclear plants ever goes ballistic on us -- you offer us reassurances, but they are empty ones.

Clarington Mayor Foster spoke of how citizens there support the nuclear business, but I know quite a few who don’t and some of them are here. And while someone else here claims citizens in Durham Region have been informed about what to expect in the case of a doomsday scenario, we have not in fact been told, and none of us have a clue. And newsletters from Pickering -- which I live much closer to at the moment than I really strictly care to -- do not tell us.

And this is not good enough for me or my

fellow citizens, we who live in the nuclear shadow of the Pickering and Darlington nuclear reactors. If a wind turbine or bank of solar panels were to fail, no one would have to evacuate or die of cancer.

(APPLAUSE/APPLAUDISSEMENTS)

Another former nuclear industry person, Arnie Gundersen -- I'm betting you've all heard of him -- spoke at the waste conference that I attended last weekend and summarized five problems with nuclear power that have been the same ever since 1942: secrecy controlled by the nuclear priesthood, financial subsidies that could have been spelt -- spent elsewhere, waste heat discharged into rivers, decay heat that continues even after a nuclear plant shuts down and, finally, high-level waste that must be sequestered for a quarter of a million years.

At this conference, it came to me that people who are nuclear proponents are always living up in their heads. They've vacated their hearts altogether and are probably not able to be moved, as I was, to tears for example, when I heard first a young man from the Los Alamos area speak of the impacts the nuclear industry has had in his area where his people have lived for thousands of years. And then a Native American woman who spoke of the shameful, painful, dangerous legacy that has been left to her people with the uranium mining wastes that poison

their land and their rivers and their bodies.

And another speaker told us of her experiences at Rocky Flats in Colorado, and that houses are being built on contaminated land there. And I bought a copy of her book, *Body Burden*, although it will probably be very hard on my heart to read it.

You see, I've been talking about nuclear waste, but nuclear energy isn't just about nuclear waste. It's about physical wastes, yes, that are going to be dangerous for longer than any of us can even imagine or begin to get our heads around properly planning for. And it's also about waste of nature, and natural places, and places that are homes to people and wildlife. But now they are poisoned homes and bodies and wildlife. And it is all about wasted human potential.

It isn't all about money, you see. Not everything is all about money. But this sad waste of human potential, that is a really sad and even heart-breaking kind of waste, isn't it? It is heart-breaking for those of us who still have hearts that haven't been put into the deep freeze.

Buffy Sainte-Marie sang, "It's delicate confronting these priests of the golden bowl. They preach from the pulpit out of the bottom line. Their minds rustle with million dollar bills. You say silver burns a

hole in your pocket. And gold burns a hole in your soul. Well, uranium burns a hole in forever. It just gets out of control."

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Could you -- could you please summarize?

MS. McNEILL: Yes. I want to ask you now for some specific things: to recognize that inadequate emergency preparations have been made for this massive and wildly expensive refurbishment plan, and for independent monitoring so that citizens who live around the nuclear plants in Durham Region can find out for ourselves what is going out into our air and our water supplies, and for this screening to be bumped up to a full panel review.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you. Questions? Mr. Tolgyesi.

MEMBER TOLGYESI: You were talking about independent monitoring. I suppose that's what's of interest to you is to have results, data from this monitoring. Now, during yesterday and before yesterday, Natural Resources, Health Canada, they were saying that they are collecting -- Minister of Environment -- they are collecting data. And what was said also that it will be difficult to put them together and render them public. Is

it responding to your request about independent monitoring?

MS. McNEILL: I want to be sure that it's not the foxes minding the henhouse. I don't necessarily trust OPG, right? Actually, I don't really trust Environment Canada either, but --

MEMBER McDILL: But what about Ministry of Labour and Health Canada, I think they were both collecting data, excuse me.

MS. McNEILL: The problem with our government -- federal government departments is sometimes it seems they stop sampling when it becomes inconvenient. I know they stopped sampling after Fukushima. We all heard about that that. I guess the data was inconvenient and so ---

THE CHAIRMAN: Ministry of Labour is provincial.

MS. McNEILL: Yes, yeah, so that doesn't apply to the Fukushima thing. I would, yeah, I would like to be reassured that -- that we're getting true data about what is, I guess a lot of it is not measurable though, so, but anyway it would still be good to be getting some, some monitoring that we can trust, that the public can trust. We usually hear about spills, you know, quite a while after they've happened and they are always small of course

and...

MEMBER TOLGYESI: So if---

MS. McNEILL: ...these kinds of things.

MEMBER TOLGYESI: ...if you say the government departments are not independent who you consider will be independent?

MS. McNEILL: I'm not sure. I know that environmental groups don't have the time or resources to do it but I guess it would be great if there was an independent contractor of some kind who did this kind of monitoring and testing and spreading the word. Actually since the other day, Dr. Cathy Vakil was here to speak for Canadian Association of Physicians for the Environment and she's asking someone to get some data, some... I'm not sure who that data is from but... I'm not sure. It's hard to know who to trust in this.

THE CHAIRMAN: Any other. Dr. McDill?

MEMBER McDILL: I think, Mr. President and again we've seen the intevenor requesting more information on -- on emergency planning. It's consistent and repetitive it seems.

THE CHAIRMAN: Sorry, so what do you suggest?

MEMBER McDILL: I'm only observing that this particular intervenor --

THE CHAIRMAN: Well, we've discussed emergency planning before --

MEMBER McDILL: Yeah.

THE CHAIRMAN: And we will continue to discuss this. I don't know what else, I'm sure you been here for the last two and a half days and you been hearing about the emergency plan and all this goes with it and ---

MEMBER McDILL: Maybe I could try. What would you like to see from EMO? What would address this concern? Obviously a pamphlet in the mailbox might not do it. I don't know what.

MS. McNEILL: Well I thought EMO had actually asked for more rigorous emergency planning from OPG. There was that letter that was made, mislaid that came on July 18th. Unfortunately I don't have it in front of me, I didn't bring it down with me from my stuff but --

THE CHAIRMAN: No, I can help you there. They ask the CNSC to reconsider a letter that they ask about -- why am I explaining this? Why doesn't staff explain this? What was the MOE request? At the end of the day it's the MOE who are developing those plans, EMO, sorry, EMO and they are this is the agency that actually has the provincial responsibility and authority to actually develop this kind of plan which will integrate all the players.

MS. McNEILL: They seem to be suggesting that they needed more. That was my sense of that that mislaid letter from July what was it July 16, I can't remember when it got coughed up but it was mislaid and then it appeared and it seemed to me it was asking for some more rigorous planning to be done.

THE CHAIRMAN: Staff.

MS. THOMPSON: Patsy Thompson, for the record.

So just to -- to be clear. The letter is in attached to or the staff supplemental CMD which is H-13.8 and the disposition of Emergency Management Ontario's request is in the text of the supplemental CMD.

Essentially we explain that the approach that was used for the Darlington Environmental Assessment is the same that was used for previous environmental assessments like Pickering B and following the, that the letter came to our attention there was a meeting between CNSC staff and Emergency Management Ontario where this issue was discussed and taken into consideration the next steps and the Fukushima action plans and other related items, EMO, and confirmed here yesterday I believe, that they were satisfied with the staff's response.

THE CHAIRMAN: Thank you. Ms. Velshi.

MEMBER VELSHI: You mentioned at this

conference, I think you said last year on waste management and decommissioning, that someone from Lepreau had said that the waste from refurbishment had, the volumes had been a lot more than they had anticipated. Is your concern related to this project that perhaps in the environmental assessment they may have underestimated the volumes from the refurbishment waste?

MS. McNEIL: Well, it seems very likely. I mean these folks were saying that, you know, that they had gone into a refurbishment and the waste proved to be a great deal more than they had expected, five times more. So they were making a plan in the midst of things. I know I get confused because it was Francois Bilodeau from Hydro Quebec. That was the one, that’s right, it was Francois Bilodeau from Hydro Quebec who said that the planned refurbishment at Gentilly 2 was going to create five times as much. Of course, we didn’t know at the time that he said that that the plant would later be shut down. And it was Charles Hickman from New Brunswick who said that Point Lepreau had been challenged during the outage, now my understanding is that the outage was due to the refurbishment, right. The outage was happening because of the refurbishment. The amount of low and intermediate level waste that has been generated compared to that which was expected. So in other words they weren’t -- they

weren't ready for it.

I guess -- I guess refurbishments create a lot more waste than even the industry can -- is aware of.

MEMBER VELSHI: We can ask OPG if they can comment on that.

MR. TREMBLAY: Yeah, I'll ask Dietmar Reiner to deal with that specific, yeah.

MR. REINER: For the record I am Dietmar Reiner.

So a couple of aspects to this and we heard some of this from from the Candu Energy folks yesterday. The waste associated with components that get removed during the refurbishment, the volume of that is well known.

The issue with that is how that waste then gets dealt with. So the volume reduction putting it into storage containers, putting those storage containers into waste management buildings, so it's those downstream impacts. And I believe there were some issues associated with that.

In our planning we do look at the entire stream of component waste right to putting it into the containers and into the onsite storage buildings.

The other, I think the other big contributor at Point Lepreau was that that project went

well beyond the original schedule so when you're planning the work and you're planning the volume of waste that gets generated by the work. When the work takes two or three times longer than anticipated you can expect to see a significant increase in the waste that's generated and that's why the planning up front is so essential in terms of the durations of the project activities.

MEMBER VELSHI: Because I think what I also heard was it wasn't that higher level waste. That it was probably the lower level waste because then they had to send it for incineration. Or at least, they were contemplating sending it for incineration so you think that difference was just because probably of schedule delays then.

MR. REINER: Correct.

THE CHAIRMAN: Anybody else?

MEMBER HARVEY: Merci, Monsieur President.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Merci, Monsieur President. Just to continue with the waste. In page 3 of your written summation about waste "a continuation that", this is the fourth paragraph top of the page:

"A continuation of operation at Darlington will lead to a considerable increase in the amount of nuclear waste being transported around Ontario... the

public will not support this increased transport in our community." (As read)

Well, maybe you could comment and then I will ask OPG to give an idea of the increase.

MS. McNEILL: Well my understanding is that waste is, oh, I'm sorry. There is a waste management facility at Darlington. I was thinking about waste being transported to the Bruce which I guess is happening on a regular basis.

There is a problem with the definition of waste which, you know, my understanding is that what the nuclear industry defines as low-level is not necessarily low-risk. Yeah, I just, I don't like the idea of more waste being created. In my view there is so much nuclear waste already on the planet, the energy needs to be focused on dealing with the waste that already exists.

And when I attended this conference, I was absolutely flabbergasted to learn about all the sites of nuclear waste all over the United States. And of course they've got 104 reactors down there so they're creating more all the time. We can't afford to create anymore of this stuff.

We don't know how to deal with it? We've been trying to find a solution for 60 years. We still haven't found a solution. And don't tell me that the NWMO

is a solution, it’s not. It’s probably going to produce a failed process just like all the other processes to find, you know, there isn’t a safe place to put this stuff. There just isn’t.

THE CHAIRMAN: Okay. We’ve gotta move on but I cannot, I just want a clarification. In your page 2 there is a second fact and he talks about this shipment of contaminated kitchenware being ordered out of Montreal. My understanding is that this nuclear waste is because of medical facilities in India. I mean, am I wrong? Please correct me. I think it was cobalt-60.

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

I’m trying to get to the reference, but I’ll speak globally on what the issue is.

Yes, correct, that was an improper disposal of a teletherapy machine in a different country, in specific, India, where the inaccurate melting of the steel out of those units that they have -- they use. Quite a bit of a shielding entered the steel. Hence, it got transported to Canada, but that’s an indication of our capacity in Canada in order to intercept and detect such items coming into Canada because we have detectors all over the place. And these are very infrequent because we have over millions of shipments coming into Canada and

we're able to detect one of so many hundred thousand or even million per year.

THE CHAIRMAN: Okay, I just thought it ---

MS. McNEIL: I think the way regulations are being changed, this stuff is going to wind up in consumer products more and more. That's the reason that I got involved in the radioactive steam generator shipment to oppose that because I was very concerned about that. I went to the grocery store -- or the store to buy a shower present for my daughter when she was getting married and everything comes from China and I don't trust the people in China to not put radioactive stuff in cutlery and I just don't want to have to worry about this. Who wants to worry about this? I'm sure you don't want radioactive cutlery any more than I do or radioactive anything. We have to stop making new waste and we have to start handling the waste that we already have. It's just common sense.

THE CHAIRMAN: Okay, thank you. Thank you very much.

The next submission is an oral presentation from Ms. Gasser as outlined in CMD H13.145. (sic) Please proceed.

12-H13.154

Oral presentation by

Linda Gasser

MS. GASSER: Thank you. Good evening, Commissioners, Ladies and Gentlemen. I have to apologize for my voice. I've lost it for the last four days and I just hope I don't break out into a coughing fit.

I'm not going to be speaking directly to any specific issue, but I wish to provide the political context in which Darlington is happening; especially in light of some of the presentations you would have heard from various Durham politicians and staff.

A recent statement by Dr. Binder caught my attention. An October 1st "Toronto Star" article reported him as saying, and I quote:

> "The level of ignorance about nuclear matters in the general public is breathtaking." (end quote)

In an August 21st, 2012 presentation to OPG, Dr. Binder stated that the public needs a reliable source of information. I completely agree, but who would that be? Who would be both qualified and independent?

Japan has gone to great pains to communicate that while a natural event triggered the problems at Fukushima, it was the human responses that

made this and escalated it to a man-made disaster. That committee described the negligence, the arrogance, the reflexive obedience and reluctance to question authority as it examined serious deficiencies in the response to the accident by TEPCO, by the regulators and the government. Various media reports described this as a man-made disaster caused by poor regulation and collusion between the government, the operator and the industry watchdog. I personally doubt such a report would ever see the light of day in Canada, but I think it should be mandatory reading for every Ontarian at the very least.

I'm sure you know and are aware that many Canadians are losing their faith in politicians and in our democratic institutions. There's a column just about every day in some paper about this.

A number of articles have also been written and columns about the state of public service in Canada and how it's becoming increasingly politicized. One column I often refer to was written by the late "Toronto Star" columnist, James Travers, and I provide the link in my presentation which I will email. I quote:

> "Principle is too often a lonely road in the civil service. Not everyone is cut out to let ethics and courage jeopardize paying the mortgages. Not

> every conscience is troubled by just taking orders and public accountability rests heavily on senior civil servants saying no when what politicians ask them to do is demonstrably wrong."

This problem extends well beyond the Federal Civil Service or the Provincial Civil Service. The political climate in Durham Region takes these concerns to a whole new level. Political leadership is in pretty short supply here. We have very few public servants here who are willing to speak truth to power or to evaluate issues in terms of, "Is there a net benefit to the public and is that what my recommendation is based on".

I believe many Clarington residents I know -- and I lived in Clarington between 1987 and 2010, so I know a lot of them. Would they be surprised to read that Mayor Foster suggests, as he did in his October 15 submission, that -- and I'm quoting:

> "The Municipality of Clarington on behalf of our residents would like to reiterate our support for Ontario Power Generation and the approval of the EA for proposed refurbishment."

This kind of cheerleading has no place in a process like this, but I would ask -- but you see, it makes a difference. I've been through enough of these processes to know that people think willing hosts are kind of an okay place to put some of these installations.

So where's the evidence that Clarington residents support or don't support Darlington refurbishment? In section 2 of Clarington's submission it states, and I quote:

> "OPG has the community's confidence. (And get this part) The children of Clarington grow up visiting the Darlington Station. They play soccer on the fields adjacent to the plant and they have a trust of the nuclear industry. The views and concerns expressed by other parties regarding lack of trust or confidence in OPG or the CNSC are not supported by Clarington." (unquote)

From the perspective of Mayor Foster and some others on Clarington Council and some at the region, for that fact, politics are pretty simple. You're either

with them or you're against them, end of story.

At Durham Region and Clarington, over the last two terms, in particular, factual communication with citizens has been largely replaced by staged and very infrequent consultation and professionally-crafted, information-management strategies that are really pretty much public-relations exercises to market certain industries to citizens.

Public servants are the main conduit of information to decision makers few of whom have the time or the skills to do their own due diligence and who might have limited ability to weigh conflicting information.

Often, political positions are developed and limiting decisions taken well before planning and/or approval processes would provide sufficient evidence to allow an informed decision, never mind that it be in the public interest. Big promises are often made early to build political support and then systematically eroded by subsequent staff recommendations that essentially undermine the ability of politicians to keep those.

So why am I telling you this? This goes back to Dr. Binder's, you know, comment about the public being generally uninformed. So how's Durham

informing the residents about the nuclear -- Darlington Nuclear refurbishment or nuclear accidents? This past Monday, I received this document. I don’t know if any of you who live in Clarington have received this Durham Region Logo: Are you Ready? Personal Preparedness in Durham Region. It’s 24 pages.

The document asked residents to prepare for both natural disasters and human-caused disasters. The Durham is home to two nuclear stations.

Nowhere in this document is the word "nuclear" found, though many types of emergencies are described. But they don't talk about nuclear. You see, nobody talks about the elephant in the room in Durham.

So Durham has an obligation to inform citizens about these various plans, about these various projects that are going on and how it might impact the community and what their position and what their input would be to the various processes.

I went on Ontario's Emergency Planning web page, from which I accessed an OPG document on nuclear safety and emergency planning, which is undated but clearly pre-dates Fukushima, and that's this document.

By the way, that’s a widespread problem with government documents. Few of them are dated. You never know, so even if you want to inform yourself, you

don't ever know if you're actually looking at a current, relevant document.

So after reviewing this and related document, it tells me that the province and OPG may not have fully updated emergency response plans to deal with a Fukushima scale or what some are calling a doomsday scenario event.

The political climate in Canada, in Ontario and Durham region and in Clarington makes me worry a great deal about the ability and willingness of governments and public servants to respond effectively and appropriately to any nuclear emergency.

Sad to say, the first instinct of some politicians is to dodge responsibility, obfuscate and/or limit the ability of others to hold them accountable or liable.

While I have not read the Japanese Advisory Committee's report in its entirety, it's clear that political interference was a factor, making the Fukushima accident worse.

How do you mitigate against that? How will the CNSC mitigate that? What will OPG do to mitigate that?

Nuclear is an inherently risky technology in addition to being obscenely expensive. No government

or regulator has demonstrated nuclear energy safety and, to date, no solution for the waste has been found.

Risk assessments are mathematical guesstimates, and they have their limitations. The human factor is just a big crap shoot.

I personally don't feel safe living in the vicinity of two nuclear reactors. I live in Whitby. I'm right between the two of them.

Though I love many aspects of living in Durham region, at some point I will likely move out because of the safety concerns and due to the risks to my property, which is my biggest asset.

I don't know how many people know that they wouldn't be covered by private insurers for losses due to a nuclear accident. And my anxiety increases as the willingness of governments and various agencies to communicate factual information in a timely manner decreases.

So I have a couple of very simple requests, and I’m winding up with those.

Please refer the Darlington refurbishment to a review panel so that a broader range of issues could be vetted more thoroughly. I heard -- I think her name is Dr. Thompson. I heard her response. I don't quite buy that there would not be a more significant vetting of the

issues in a review panel. And I believe I heard her say that it would still come back to you.

But it's better coming back to you looking at more stuff than you looking at less.

I also ask that you require updated, comprehensive emergency plans to the level of doomsday scenario or whatever word everybody's using to be developed by OPG, by Clarington, by Durham region and by the province so that these plans could be assessed before any decision on refurbishment is made.

THE CHAIRMAN: Thank you.

MS. GASSER: I have two sentences left. Seriously.

These plans must include alerting and/or evacuation for those within the 20 and 30 kilometre zone as a minimum, not just the three and 10 kilometre.

And last, there must also be a water supply replacement plan considered.

Thank you.

THE CHAIRMAN: Thank you.

Questions? Anybody?

MEMBER TOLGYESI: What do you mean by "water supply replacement plan"?

MS. GASSER: If there would be any contamination to Lake Ontario, there are a large number of

people whose drinking water will be impacted. For instance, I'm on municipal water now.

Municipal water supply for everyone taking water from Lake Ontario could potentially be compromised, but there needs to be plans at the provincial level as well as the local and regional level.

You know, right now in whatever documents that I have managed to get my hands on, they tell you "Keep a supply of water and don't drink the water until we tell you it's all right", but nobody's talking about how are you going to deal with supplying water to these millions of people who may have their water supply impacted over a very long period, even if they're allowed to come back to their original homes.

THE CHAIRMAN: Okay. First of all, you mentioned this insurance.

I don't know if you were here when Mr. McCauley from NRCan explained the liability and insurance. Were you here for that?

MS. GASSER: Today's my first day. This afternoon is my first visit here.

THE CHAIRMAN: It was this morning?

Well, maybe we can ask Mr. McCauley to, one more time, explain the insurance aspect.

And while he's going down to set up, you

mentioned there is no data about the citizen view. If they did a poll, a survey, if you like, of all citizen in Clarington whether they are for or against, what do you think the result would be?

I was trying to get this from the local MP, and they didn't have the numbers.

MS. GASSER: Well, you know, a lot depends on what do people know about nuclear determines how they're going to respond, so the amount of information they have about what is at issue will very much determine what the poll results would be.

So it's like if you ask people like "Do you like chips?" I'll bet you'll get the majority of people saying, "I like chips". But if you tell them, "You know what, chips are loaded with fat and salt and if you eat too many, they're going to kill you" ---

THE CHAIRMAN: They're still going to say, "Yes, I like chips".

MS. GASSER: Some people will say they might like chips, but they might not think they're safe to eat. So you know, it's what people know when you ask them the question that very much determines their response.

But I have no doubt that there could be some people who truly would sell their firstborn just to say, "You know what, the jobs are worth it". There are

people that hold that view.

THE CHAIRMAN: Okay. Thank you.

Mr. McCauley.

MR. McCAULEY: Certainly. I'll go quickly.

Thank you very much. Dave McCauley, Natural Resources Canada, for the record.

As I mentioned this morning, I guess the key principles to the *Nuclear Liability Act* is that the operator is absolutely liable, so they have no defences. There's an incident, there's damage and Ontario Power Generation is liable.

The intervenor made a comment here in terms of if they were to get liability insurance as any other corporate entity. If it was another type of insurance that is available to other corporate entities, they would have many defences in the event of a damage. Like any other industrial entity, if they create damage, they have a full suite of defences.

But in the case of the *Nuclear Liability Act*, it puts absolute liability on the operator in this case, OPG. And then all of the liability is channelled for insurance reasons away from suppliers, et cetera to the operator.

It's also away from your home insurance. For example, I think you've made that point here.

You're absolutely right. Home owners cannot get nuclear liability insurance because the insurance industry channels all of its limited capacity to the operator. They want to put it all there. And ---

THE CHAIRMAN: Let me -- so let me try to put words in your mouth.

So if there was an incident or an accident ---

MR. McCAULEY: Yes.

THE CHAIRMAN: --- that impact their home, it's the OPG that are liable to compensate. Is that the way it works?

MR. McCAULEY: It's OPG is the liable entitly. Insurance companies would be paying her because they have an insurance policy with ---

THE CHAIRMAN: But it’s going to go through the OPG?

MR. McCAULEY: That’s right. That’s right. And you’re right, $75 million is the limit and it needs to be updated. And as I indicated this morning, we are developing recommendations for the government to bring forward because it lags behind many other countries in that regard.

THE CHAIRMAN: Thank you. You have the last word.

MS. GASSER: I'd just like to respond to that with a comment. I don't think I brought it with me but I saw somewhere that you might want to up it to $650 million or some such amount. That is a fraction, a small fraction of what the real estate value is, just the real estate value.

In -- I think it's a Greenpeace or CELA report but I didn't bring it with me. They estimate the economic impact of an accident that would require at least a one year evacuation from a particular area. And I forget, I think they're using the 20 ks -- kilometre.

650 million is chump change, doesn't even buy you downtown Whitby. You know, so when you hear these responses that say, yeah, the Nuclear Liability Act and the operator is absolutely liable, it's up to a very low limit.

And do you want to be doing the wrangling with these people? I mean seriously, at this point, they have bigger problems.

You know when you think about, it is a crazy situation that somebody can think that it's economically acceptable to engage in a technology or business that produces this kind of potential impact. I mean I would say that's the definition of insanity.

THE CHAIRMAN: Okay, thank you. Thank you.

Thank you. The next submission is an oral presentation from Ms. Sherman, as outlined in CMD H-13.183. Ms. Sherman, the floor is yours.

12-H13.183

Oral presentation by

Sarah Sherman

MS. SHERMAN: Thank you. First I'd like to take a moment to thank Louise Levert for all of the hard work she's put into managing this surge of public interest and interventions in this matter. So thank you very much Louise. And thank you commissioners for inviting me to these hearings as quote:

"A member of the public who has an interest or expertise in this matter or information that may be useful to the commission in coming to a decision." End quote.

My name is Sarah Sherman and I'm not a nuclear expert. I am an actor and I live and work in Toronto. So what am I doing out here at a public hearing in the middle of a work day? I may not live in Durham and I may not be an expert but most certainly have an interest.

As a member of the public, I have an

interest in this process that will determine how billions of taxpaying dollars are spent. I have a stake in a decision that will determine whether or not, in my own lifetime, my province with have a clean, renewable energy future. And I have a duty of concern for how our environment, our health and safety will be effected by this massive project.

And it truly is a massive project. We're talking about decades of refurbishment and continued operation, decades of safe shutdown and decommissioning. We're talking about the commitment of a lifetime.

OPG is proposing that we take a Quaalude, close our eyes and commit a lifetime to their elderly reactors. Before the CNSC proceeds with this arrangement, shouldn't the public fully understand what we're getting ourselves into and shouldn't we have a fair opportunity to consider the proposals of fresh, young alternatives?

The Environmental Assessment is not fair. It is deeply false in concluding that this project will have no significant adverse effects on the environment.

As I stated in my written submission, I believe the screening level assessment is dangerously inadequate. I'm deeply concerned that OPG and the CNSC are failing to learn from the Fukushima disaster, are failing to acknowledge Darlington's true cost and risks,

and are refusing to look at alternatives.

Fukushima was a wake-up call for all of us; for Government Regulators, nuclear operators, and average citizens like myself. It forced us to re-evaluate our attitude towards nuclear safety, to ask ourselves hard questions and learn important lessons.

In light of the lessons that we have learned from Fukushima, I ask the CNSC and OPG to stop pretending that a large accident can't and won't happen here. I ask the CNSC to ensure that we are properly prepared to respond to such an emergency and I ask the CNSC, as our regulator, to sever itself from the political influence of the nuclear industry.

On accidents, I would like to join others who have spoken today and this week, in reminding the Commission what the Japanese Government's own independent Investigation Commission determined. And that is quote:

"The accident at the Fukushima Daiichi Nuclear Power Plant cannot be regarded as a natural disaster. It was a profoundly manmade disaster that could and should have been foreseen and prevented. And its effects could have been mitigated by a more effective human response." End quote.

Despite the clear acknowledgement of human error and oversight as the cause of the last three major

nuclear accidents we've seen, and despite the surge of concerned organizations and citizens demanding that our government wake up and realize that major nuclear accidents are happening, once a decade somewhere in the world, the Commission and OPG have persisted in denying that a Fukushima scale disaster is possible here.

I believe that the CNSC is negligent in its duty to protect the health, safety, and security of Canadians and the environment if it accepts, without question, OPG's dangerous assumption about what constitutes a credible accident scenario for the purpose of this EA.

Malevolent acts are considered quote, "Not possible". The effects of severe weather are considered insignificant despite the fact that we are facing a rapidly changing climate, which involves increasing severe weather events such as Hurricane Sandy which caused shutdowns and alerts at nuclear plants in its path and large radiation releases are not considered.

So once more for posterity, rather than highlighting the differences in geography between Fukushima and Darlington, I want to see the Commission acknowledge the most important vulnerability that our reactors share, and that is human error. Stop pretending an accident couldn't happen here.

On emergency response, if our government is refusing to acknowledge a large accident is even possible, how can we possibly begin to prepare an adequate emergency response plan?

There is a critical lesson to be learned from the Fukushima disaster, which saw Japan, renowned as one of the world's most advanced, experienced and prepared disaster responders, unable to deal with a chaotic process of safely evacuating its citizens. Their plans broke down and entire communities were left or even relocated to dangerously radioactive areas. Do you think that we would fare any better?

On Monday, as we've already heard, Greenpeace released a weather balloon highlighting just how far and how fast escaped radiation could travel. In three hours, it traversed Lake Ontario and landed in New York State. As we know, the wind is unpredictable. The standard circular evacuation zone, such as the appalling 3 kilometre and 10 kilometres considered in this Environmental Assessment are inadequate.

We saw that in Japan, hot spots occurred well outside the Government's own official evacuation zones. And during the chaos of such a disaster, lines of communication and trust break down. Here we are not set up to have communities independently monitoring radiation

levels.

Running a nuclear power plant that is situated on the only source of clean drinking water for millions of people and dangerously close to major populations like the GTA, which simply could not be evacuated, is not insignificant, not matter how you cut it.

Once again, I ask the CNSC to ensure we haveadequate emergency plans and the first step is acknowledging an accident is possible.

I also believe that the mandate of the Canadian Nuclear Safety Commission must be completely separate from the agenda of nuclear expansion. Otherwise, how can it possibly make impartial decisions about what is safe?

To once again quote Japan's independent Investigation Commission, quote:

"Nuclear Power became an unstoppable force, immune to scrutiny by civil society. Its regulation was entrusted to the same government bureaucracy responsible for its promotion." End quote.

While the CNSC remains under the Department of Natural Resources Canada which promotes nuclear energy, I don't feel this objective distance is possible. Instead, we will continue to see nuclear lobbyists and

politicians in a cozy relationship that puts profits before people and the environment.

This brings me to the second major concern I expressed in my written submission; that this Environmental Assessment has failed to acknowledge Darlington’s true cost and risk or examine alternatives.

I ask the CNSC and the Department of Fisheries and Oceans to stop allowing OPG to damage Lake Ontario and to threaten it. I’d ask for a full and public review of nuclear power versus cleaner, safer, cheaper alternative energy options that are available.

An example of the cozy relationship I mentioned is that the government has been turning a blind eye to the fact that Darlington has been breaking Federal law for years by killing millions of fish eggs and larvae, granting an authorization under Section 32 of the Fisheries Act so that OPG can continue to put profits before people and the environment will be astonishingly wrong.

The only conscionable option is to install the modern industry standard, a closed cycle cooling system like our neighbors to the south do.

While we’re on the topic of profits and people, why does OPG and our government promote the misinformation that nuclear is cheap? That it is cheaper,

in fact, than renewables. OPG has boldly claimed that it is quote:

> "Confident the project that could be completed safely, on schedule and on budget."

And while I congratulate them for their ability to think optimistically, I would point out that no nuclear project in Canada has ever been completed on time and on budget. We're still paying the price of cost overruns from the original Darlington reactors on our energy bills.

The billions of dollars we're about to spend on nuclear reactors and the surplus of energy when they come online will kill green energy in this province. As we heard from an intervenor earlier this afternoon representing a number of green energy operators, those operators assume the risk and responsibility of standing behind their projects, unlike the nuclear industry who hide behind the *Nuclear Liability Act*. The nuclear industry profits when things are good, but if things go bad, it will be the devastated citizens who will shoulder the losses and damages beyond a measly 75 million.

At a time when Quebec is shutting down its only reactor, and Germany, Japan, and other countries are transitioning to renewable energy, why are we locking down

into dirty, risky nukes unnecessarily?

Considering the enormity of the cost risk and consequences of this project being proposed, I want to ask the Panel, do you truly believe that this screening level assessment is adequate and honest? Are we all here to give serious and proper consideration to the matter or am I participating in a rushed process of rubber-stamping this project? Assuming that we are not here to rubber-stamp this project, I'd like to ask OPG how they justify the 300,000 square foot training facility that is already under construction in Clarington; how much taxpayer money has been spent constructing a training facility for a project that has not yet been approved?

As I said, I am no expert but as Mr. Harvey had mentioned earlier there are a number of experts in the room this week and they, like me, have been given 10 minutes to speak. This is shamefully inadequate. My opposition to the refurbishment of Darlington reactors has been informed by the extensive reports of these experts from such organizations as Greenpeace, Lake Ontario Waterkeeper, the Canadian Environmental Law Association, and many others. The major concerns they have brought to light and the suggestions they have proposed have been overlooked at every step of this process. I hope that in speaking here today, I've helped to make it clear that

these organizations have the strong support of the general public who are paying close attention to what is going on here.

If I may conclude, I do not accept that this Environmental Assessment can adequately determine whether refurbishing the Darlington reactors will have significant environmental impacts. The CNSC and OPG have failed to apply lessons learned from the Fukushima disaster.

Because this Environmental Assessment does not seriously consider large-scale accident risks, does not include proper emergency response planning for such large-scale accidents, and refuses to look at cleaner, cheaper, safer green energy alternatives, I believe this project must not be approved.

Thank you.

THE CHAIRMAN: Thank you.

Question? Okay, let me start. Most of those issues already been discussed for the last two and a half days. Let me start with the training facility, that’s a fair, new question, it hasn’t been raised yet.

MS. SHERMAN: That’s excellent considering I’m not being paid to be here, so ---

THE CHAIRMAN: Can you let them answer first?

MS. SHERMAN: --- I'm not able to be here for the whole hearing so that's great.

MR. TREMBLAY: Pierre Tremblay, for the record. I'll ask Dietmar Reiner to touch on the deck.

MR. REINER: Dietmar Reiner, for the record.

The training facility that we're constructing, it's an important part to the planning phase of the project. It's not linked to this Environmental Assessment specifically but it is an element of the planning activities that we are undertaking and it will also serve us in the ongoing maintenance and operations of the plant. That will be a facility that we will use for maintenance-related activities beyond just the refurbishment project.

THE CHAIRMAN: If the project doesn't proceed, what happens to the training facility?

MR. TREMBLAY: Pierre Tremblay, for the record.

It's an excellent facility for -- it's a full reactor mock-up. We do extensive amount of reactor work, inspections and so forth. Clearly we would use it for that. In fact, you know there's a significant campus plan that we put in place to kind of look at facilities, age-expired and so on and this is part of that overall

plan.

THE CHAIRMAN: Thank you. Anybody else?

Okay, you have the last word here.

Thank you. Thank you very much.

The next submission is a presentation by North American Young Generation in Nuclear, Durham Chapter, as outlined in CMD 13.158 and 13.158A, and I understand that Ms. Corkum will make the presentation. Please proceed.

12-H13.158 / 12-H13.158A
Oral Presentation by the
North American Young Generation
in Nuclear (NA-YGN),
Durham Chapter

MS. CORKUM: Thank you, Mr. Chairman. Lauren Corkum, for the record.

My name is Lauren Corkum; I have four years of experience working in the nuclear industry with Ontario Power Generation, and I'm currently working toward a Master in Nuclear Engineering.

I'm here today to represent the members of the North American Young Generation in Nuclear, Durham Chapter as the Public Relations Chair. I'm accompanied

here today by Engaged Members Shruti Khanna and Vajira Jayasinghe.

North American Young Generation in Nuclear is an organization which unites young nuclear professionals who are under the age of 35 or who have less than 10 years of experience, and provides them with opportunities for networking, professional development, and community outreach. We are an energetic group who have a passion to power the future.

We are here today to strongly support the licence renewal of Darlington, the Darlington Waste Management Facility, and the Environmental Assessment for the Darlington refurbishment project.

We believe that it’s important to share our perspectives as young nuclear professionals as many of us both live and work in the Durham Region.

NA-YGN, Durham Chapter strongly supports the continued operation of the Darlington units as they positively impact the economy and the environment while operating safely and reliably. Darlington provides Ontario with 20 percent of its electricity. This is the lowest cost scaleable source of low-carbon electricity where carbon emissions are on par with wind energy for carbon emissions per kilowatt hour.

By providing low-cost base load electricity

to Ontarians, every person in Ontario benefits. The NA-YGN, Durham Chapter also supports the refurbishment of these units as they extend these benefits further into the future for this region and for Ontario.

The nuclear industry also provides benefits with respect to job creation. Approximately 71,000 Canadians are employed in the nuclear industry. In Ontario alone nuclear supports 15,600 jobs and 7,800 direct jobs annually, many of them in this region. Darlington refurbishment will create even more jobs in this region as OPG is expecting to employ an additional 2,000 people for the next decade.

Also, at a time when young Canadians are struggling to find fulltime employment, 18 percent of employees at Darlington are under the age of 35. As an employer in the nuclear industry, I am one of these people, and I love my job. Like the other young nuclear professionals we're representing today, I'm getting the opportunity to learn and to grow and to develop a career.

Many of us are establishing ourselves right here and starting families in the Durham Region as a result of these opportunities. The representatives here today will be speaking to you about safety, the waste management, as well as the environmental focus of our industry.

MS. KHANNA: Shruti Khanna, for the record.

There's no job that is so important that it cannot be performed safely. This was the first advice I received from my manager when I joined the nuclear industry in 2008.

I have been working with Ontario Power Generation for four years, and like many OPG employees, I too live in the Durham Region. I joined the NA-YNG organization soon after joining OPG as I strongly believe in the future of nuclear power in the Province of Ontario.

Since the day I started with OPG, safety has been my number one priority while performing daily tasks or planning work for station staff. I have also consistently observed in the past four years that no matter how simple or complex a task is, workers at OPG focus on procedural compliance to ensure every task is completed safely and event-free.

Work procedures are written and assessed in great detail to provide clear instructions, identify hazards, and they include steps to minimize or eliminate those hazards.

It is this safety culture that resulted in Darlington achieving 12 million hours of work without a lost time accident in 2011.

The CANDU design of Darlington reactors is

based on defence in depth philosophy. This means that for each reactor unit, there are multiple technological and operational safety measures that minimize the chance of an event and the possibility of its harmful effects on employees and the public.

Each of Darlington's units is fitted with rapid shutdown systems that can stop the chain reaction within seconds. In addition, the station containment systems are designed to lock harmful radiation within the facility.

Darlington nuclear has been operating safely for more than 20 years now and with successful refurbishment, it will continue to operate for another 30 years. Having said this, members of NA-YGN Durham Chapter realize that the ultimate responsibility of this facility's safe operation will always remain with its employees. Employees need to be fully committed to safety in order to protect the public as well as the environment.

I would like to mention that the staff at Darlington has already demonstrated this commitment when they received an international award of excellence earlier this year. Darlington became the first Canadian nuclear station to receive such an award.

Having said this, even with such an outstanding achievement, they are continuously striving to

improve the plant safety culture even further.

In conclusion, the NA-YGN Durham Chapter believes that refurbishment of the four Darlington reactors will not compromise their safe operation. The existing standards and procedures will ensure that the plant remains within the safe operating envelope and new procedures will be introduced as we learn from industry's operating experience.

The defence in-depth philosophy will ensure that there are multiple and redundant nuclear safety provisions to protect workers, the public, and the environment from radiological hazards of nuclear power plant operation.

Last but not the least, the staff at Darlington Nuclear will remain committed to nuclear safety as their overriding priority.

MR. JAYASINGHE: For the record, my name is Vajira Jayasinghe.

I've been working in the nuclear industry for four years in the Inspection and Maintenance Services Department of Ontario Power Generation. I'm also working towards a Masters degree in nuclear engineering.

As a young nuclear professional, safety is always at the forefront. This applies to how I accomplish my daily tasks and also applies to how we operate our

stations and safely manage waste.

The Darlington Waste Management facility is a key element for safe storage of used fuel. At Darlington, once fuel has been sufficiently cooled in a water bay for approximately 10 years, it is transferred to a dry used fuel container where it is stored in the waste management facility.

I have personally had the opportunity to visit and provide technical support for this facility and the process of storing fuel has always impressed me.

The proposed next step is to permanently store this fuel in a deep geological repository. The nuclear waste management organization or NWMO has been tasked with working with industry, research and government organizations to develop this long-term management plan. The NA-YGN Durham Chapter is confident the NWMO will be successful in this endeavour and in working with communities to implement this long-term plan.

The reason why we focus on safe waste management is because our concerns are no different than those of the community. We, as nuclear workers, are committed to the environment. Every day we assure that our impact to the environment is as low as reasonably achievable.

In 2011, 96 percent of the electricity

produced by Ontario Power Generation came from sources that produced virtually no emissions contributing to smog, acid rain or climate change.

The Darlington station helped contribute to this number and I hope it continues to do so for many years. This focus on the environment has also been recognized by external organizations. In 2012, Ontario Power Generation was awarded the Canadian Electricity Association Sustainability Company of the year. This award is for OPG's commitment to minimizing environmental footprint through innovative initiatives and partnerships.

And in 2009, the Wildlife Habitat Council bestowed its Conservation Education and Outreach Award for OPG's history of striving for excellence in biodiversity.

As young nuclear professionals, a fundamental driver for our support of the nuclear industry is that it is a sustainable means of meeting Ontario's power requirements for the present and future.

MS. CORKUM: Lauren Corkum for the record.

In summary, NA-YGN Durham strongly endorses the licence renewal of Darlington, the waste management facility and supports extending the benefits further into the future by investing in refurbishment.

We support nuclear power, as it is a low cost, reliable and sustainable means of producing

electricity. It also provides many economic benefits to this region and to Ontario.

As young nuclear professionals, we have a passion to be a part of Ontario's energy future.

Thank you. And at this point, we welcome any questions.

THE CHAIRMAN: Thank you. Questions?

Well, let me ask you one. You were here when you heard that some intervenors don't exactly agree with your view on this. And they argue that in Fukushima presumably there are also workers that believe in defence-in-depth. So what do you say to that in terms of being worried about safety?

MS. CORKUM: For the record, Lauren Corkum.

I would like to start out by saying that what happened in Fukushima was a tragedy and it's something that everyone in the nuclear industry is taking a long, hard look at and learning from.

I know things at -- I know there have been a number of changes at Darlington already. I know the project manager for the passive autocatalytic recombiner system has been working hard to get those hydrogen systems installed in the vault.

I know of pumps that we've acquired and our work on severe accident management plan. The point is

that I believe that we are a learning organization and I'm very proud to say that we take operating experience very seriously in our industry.

I believe that I feel safe working at a nuclear power plant, and I enjoy the work there. And that's why I'd like to continue doing that work further into the future.

THE CHAIRMAN: Okay. Thank you. Thank you for this presentation.

MR. LEBLANC: The next presentation is from Ira Rabinovitch, but we have not been able to locate him. Are you here, Mr. Rabinovitch?

It doesn't look like it. So we'll go to the -- we'll treat it as a written submission, and we'll go to the next submission.

MR. LEBLANC: Mr. President?

THE CHAIRMAN: The next submission is by the Women's Healthy Environments Network, as outlined in CMD H13.160. And I understand that Dr. Goldin Rosenberg will make the presentation. Please proceed.

12-H13.160

Oral presentation by

Women’s Healthy Environments

Network (WHEN)

MS. GOLDIN ROSENBERG: Thank you very much and greetings everybody in the room. I'm very pleased to have heard so many amazing deputations this afternoon and I'm very pleased especially with some of the youth that I've heard.

I was very concerned actually to learn today that one of the Members of the Commission has a long history with the nuclear industry, and it was something that I was not aware of previously. Louise Levert gave me some papers about an explanation by CNSC, but I'm afraid that I don't accept those explanations because I don't know that somebody who has worked for the industry for many years can be an independent person on a panel such as this.

So I just wanted to comment that.

(APPLAUSE/APPLAUDISSEMENTS)

MS. GOLDIN ROSENBERG: I find that quite shocking and it's I don't think appropriate, and I'm sure if people knew about it, they'd be quite upset as well.

So I'm Dorothy Goldin Rosenberg, as you've mentioned. I teach about environmental and ecosystem health to graduate students at the Ontario Institute for Studies and Education at U of T, and my presentation is on behalf of the Women’s Healthy Environments Network. I'm a

volunteer education coordinator.

We promote a safe clean environment and the use of the precautionary principle with regard to contaminants causing harm to our health and the ecosystem on which we depend. It's the reason that I'm doing this work. We believe that WHEN can make a difference and individuals can make a difference when they work very hard to bring action for prevention in our homes and communities. But there's also an important role for governments and their agencies to protect human health and the environment.

As I've said in my previous submissions, I'm not paid here to be here. I'm not paid like many of you here from the industry. I'm not paid to be here. I come as a volunteer because of the concerns I have for the future of the planet and the concerns about nuclear power that you’ve heard so much of it in these interventions.

And I might add that many presenters whom you’ve heard and you will hear, are very sceptical about the outcome of this hearing. And some of them debated as to whether or not to even participate because they assume, as in the past, it’s going to be a done deal by the industry and governments, and it’s going to be for the go ahead for the refurbishment of Darlington -- this despite the many cogent, well-researched, evidential documents to

the contrary. And they want a safer and sustainable future.

And because of this, it’s been deemed a kangaroo court. I don’t know if any of the presenters mentioned those words, but a kangaroo court is -- in other words, don’t convince me with the facts, my mind is already made up. So we’re hoping that this is not going to be the case again because you’ve heard a lot of evidence in a different voice.

In my previous Darlington new build hearing presentation last year; my focus was on the health impacts of ionizing radiation, primarily on women, the developing foetus, and young girls developing breasts in puberty. You know that radiation harm includes not only cancer and leukaemia, but reduced immunity, reduced fertility, increases in other diseases including heart disease, birth defects, including heart defects, and other mutations both heritable and inherit, and not.

We talk a lot about the precautionary principle in environmental medicine and environmental health. The precautionary principle states reverse onus -- which means proof of absolute safety beforehand, and I wonder if that can be proven with regard to nuclear power.

It also talks about community right to know. And it talks about safe transition to jobs for --

safety for workers in the industry. We don't want to shut everything down, we want to help train them for other careers. And the other is public participation in all decision making. Let's do that with Darlington, if we can.

As an environmental health researcher, educator and film producer -- and I made a film on breast cancer prevention and on children's health in the environment, an NFB co-production – I'm very aware that we have more than enough evidence of the growing numbers of diseases and conditions related to preventable exposures of toxic material including radiation.

And since the catastrophe of Fukushima, -- and you've heard so many, so many stories about this here, even this afternoon -- we still have not made -- seen major changes in terms of the development of what Ontario is planning to do.

And following -- but following that crisis in Fukushima, radiation has now been detected in the air, water and food, not only in Japan, but it's all over -- all over the world, many parts. The long-term health impacts are going to be widespread and this tragedy's described amongst the worst in the world.

Initially, some of the reports revealed the negation, denial and cover-up by the nuclear industry, the

International Atomic Energy Agency, and supporting governments. The denial and cover-up was similar to that following other major nuclear accidents with the language of safe and allowable levels of exposure. With Fukushima, it’s now been proven otherwise according to numerous ongoing reports from Japan.

It must be understood and reiterated that there is no safe dose of ionizing radiation, and even the smallest dose can call cancer and other health effects. And we’ve heard that from others, but we’ve also heard it negated by others here.

But this is -- the Biological Effects of Ionizing Radiation, the BEIR VII Report from the National Academy of Sciences -- we’ve known about this for years from other scientists, but this was a major report that came out a few years ago. Indeed, radiation is a known human carcinogen according to the International Agency for Research on Cancer, IARC of the World Health Organization, and all nuclear facilities release some radiation. IARC lists a number of radionuclides as proven causes of cancer including those produced from mining, milling, manufacturing and the use of uranium fission in nuclear power plants.

As a former health professional, I can also attest to the pain and suffering of families who are

related to -- who've had diseases from -- related to radiation in their own lives and in their families. We know that about half the population is going to be affected by cancer in Canada. It's really very, very, sad. I'm sure all of you have families, friends, other people in your work, world, who have been diagnosed with cancer -- if it's a diagnosis of your mother, your sister, your wife, your partner, your daughter, or friend with breast cancer.

We know that this is a tragedy. And we have to ask how much of this cancer is preventable? We have to ask how much is related to ionizing radiation. We know that, for the most part, cancers are only five to ten percent due to inherited genetic mutations, so we have to ask what is causing the other 90 to 95 percent to develop the disease and how are we going to present it?

You've heard many deputations on all aspects of the whole nuclear fuel process. I'm not going to go into any of them, but we have to notice -- we have to note that there is no safety and there is no protection when it comes to ionizing radiation. And even the tiniest amounts can cause havoc and harm as others have said.

My own history is huge on this issue. I've been working on these issues for the last 40 years. Tomorrow I understand you're going to hear from Gordon

Edwards by Skype or something on his deputation, which he's -- we were founding members of the Canadian Coalition for Nuclear Responsibility -- we've been doing this work for decades, and decades, and decades.

We worked with Ursula Franklin, Canada as a Conserver Society, it was the -- under the Trudeau regime, it was Science Council of Canada, we had Amery Lovins coming up, we were learning about all the alternatives. We were learning about the harm, as you know -- I'm sure most of you know who Amery Lovins is -- and he was a nuclear scientist and he became an expert in energy and alternative energy. They did soft energy paths for all the different provinces looking at where we wanted to be in 50 years getting off a lot of this hard path stuff.

So I have this background. I know a lot. In recent years, I came to Toronto, been working on a lot of these issues here through the Toronto Cancer Prevention Coalition. We were very instrumental in bringing tritium in the drinking water to the issues of the Ontario Drinking Water Advisory Council through the Medical Officer of Health. That was a whole process that we did. And we know that we initiated that to bring attention to a fact that was not even on the agenda or the radar of Toronto Public Health, and the Medical Officer of Health, and the Council -- the Toronto Public Council, the

councillors. So they didn't know anything about this until we revived this because nobody had talked about it since 1994 and the ACES Report.

So there's just a lot of history that people are not aware of. And you've heard from some of the organizations now. You know some of the resistance that they have been giving to what has been happening. You know that the accident of Fukushima, as many of you have heard, has incredible implications for the future and for all of us. And we know what the solutions could be. I won't reiterate all of them because you know them.

The group, a consortium led by the Canadian Environmental Law Association -- and we work with them in the Toronto Cancer Prevention Coalition -- they called for the cancellation of the Darlington new build and the hearing, and the refurbishment stating that Fukushima raised significant issues that were not being addressed within the scope of the current review, as you have heard from others. They highlighted the safety problems with Darlington's multi-reactor design, I mean I can -- you've got this in my submission. I'd be happy to tell you more about them, but I'm just going to read the headlines of it.

Earthquake vulnerabilities which others have raised and there's a lot research on that -- this is

an earthquake zone. The CNSC's approach to nuclear safety -- and you know that former CNSC President, Linda Keen, has publicly stated that Fukushima teaches us that nuclear regulators must now be prepared to approach nuclear safety in another way.

And it's noteworthy that CNSC has historically prevented publication of risk studies used to dismiss and ignore certain types of accident events. And in light of Fukushima, this weakness in the CCN -- CN -- Canadian Nuclear Safety Commission approached a nuclear safety and information disclosure must be addressed and corrected before any approval is made for the Darlington refurbishment.

Then there's a whole section on nuclear used fuel storage, which is very critical and important and in terms of safety. And I know from some pilots who fly planes, that you can just fly over the reactors and -- and I just -- I heard helicopters flying over this area a few minutes ago as well, so you know, who knows what somebody could do?

Anyway, there's all this stuff about the Nuclear Liability Act which you've heard -- I won't go into. And what we need to do is really focus on what is possible and what should be done.

I hope you have all read the detailed Amery

Lovins review -- the eight points that he gives in terms of this kind of analysis for the future. Amery Lovins, he's a co-founder, chairman and chief scientist at the Rocky Mountain Institute. He cogently informs on sustainable possibilities -- not the highly centralized, dangerous, expensive power plants proposed by governments and the nuclear industry. And while most of this description is the U.S. context, the opportunity is similar for Canada.

THE CHAIRMAN: Would you please summarize --

DR. ROSENBERG: Yeah.

THE CHAIRMAN: -- and wind up, please.

DR. ROSENBERG: Yeah. I want to -- I just want to -- I have a section on policies and -- politics and policies -- a reminder of reality.

And I have a section that I'd like people to hear, because it's about the late Rudi Nussbaum, Professor Emeritus of Physics and Environmental Sciences at Portland State University, who exposed the nuclear and radiation health establishments.

In 2007 he wrote industry, government and the military have systematically supressed or manipulated epidemiological research showing detrimental effects on human health from accidental or occupational exposures to

ionizing radiation. This leads to conflicts of interest and compromised integrity amongst scientists in the radiation health establishment. It stifles dissemination of unwelcomed findings and endangers public health. And as noted, since the nuclear industry and support of governments routinely deny the health impacts of these carcinogens it's critical that they be widely made known. Nuclear issues are political and therefore they must be dealt by policy issues.

And I've said that the International Atomic -- the World Health Organization, the most prestigious health institution in the world, is bound by a 1959 agreement ostensibly for lack of radiation expertise within the WHO to refrain from conducting any published radiation health assessments without approval by the International Atomic Energy Agency, an agency who have mandate to both promote nuclear power and to safeguard us. This is consistent with many misleading press statements and reports issued by these agencies downplaying the legacy of disease and death left by Chernobyl.

THE CHAIRMAN: You're going to allow us to discuss this or ---

DR. ROSENBERG: Yes.

THE CHAIRMAN: --- are you going to ---

DR. ROSENBERG: And I just want to ---

THE CHAIRMAN: We have read ---

DR. ROSENBERG: Let me just ---

THE CHAIRMAN: We have read the submission.

DR. ROSENBERG: Okay.

THE CHAIRMAN: So please wind up.

DR. ROSENBERG: Let me just say one thing about this. I just heard -- I just read something recently, just this past week, on a similar statement from the International Atomic Energy Agency on Fukushima denying the dangers.

So you've read what must be done with what I'm respecting and what I'm suggesting. And I want to just close by saying that the latest inter-governmental panel on climate change reported that eight percent -- 80 percent of global energy could come from renewable energy by 2050. The constraint in making this a reality is not technology, land area, or resources but political will. The IPPC concluded maybe you could transfer the political world that has been devoted to nuclear for all these years to renewables we can achieve that goal.

So thank you very much.

THE CHAIRMAN: Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Okay, questions? Who wants to start?

Let me start with this -- with something I find -- you know, I know the IARC and the WHO agreement. I've been hearing this story now for a long, long time. I just never, never was able to dig up this so-called agreement in bound, and I just don't buy it ---

DR. ROSENBERG: I would be happy to send it ---

THE CHAIRMAN: --- because the WHO has been saying whatever they're saying -- in fact, they've issued their own kind of a health ---

DR. ROSENBERG: Okay.

THE CHAIRMAN: --- statement a long time ago. I don't want to hear from you now.

DR. ROSENBERG: Okay.

THE CHAIRMAN: I would like to hear first from staff.

DR. ROSENBERG: I just want to say I'll be happy to send you the reference.

THE CHAIRMAN: Not the reference. I want to see the agreement.

DR. ROSENBERG: Oh, I can ---

THE CHAIRMAN: I know where the reference comes from. Just the actual agreement.

DR. ROSENBERG: The Physicians for Global Survival have dug that up, and I'll provide that to you.

THE CHAIRMAN: Go ahead.

DR. THOMPSON: Patsy Thompson, for the record.

So the 1959 accord between the two UN agencies the actual agreement states that whenever either organization proposes to initiate a program or activity on the subject in which the other organization has or may have a substantial interest the first party shall consult the other with a view to adjusting the matter to a mutual agreement. That is the actual wording of the agreement -- of the 1959 agreement.

THE CHAIRMAN: Is that bounding on any organization to do whatever they think they need to be done?

DR. THOMPSON: Essentially, what I would say is that the World Health Organization, through the International Agency for Research on Cancer, has done extensive work on radiation effects, have published reports, have published in the open scientific literature, and there is absolutely no evidence that this agreement has ever impeded the health studies of any kind.

Could I also add that the -- the intervenor says that the -- Dr. Nussbaum has said that the findings of health effects have systematically been ignored. I would say it’s quite the contrary. That every study that

has ever shown health effects has been taken into consideration in terms of adjusting our science and adjusting our standards.

The risk standards are based on studies of the atomic bomb survivors, workers exposed to radium, exposed to uranium mining radon progeny, all the studies that have been done on children exposed in utero, all of these studies have been published, they're well known and have been used to develop standards.

DR. ROSENBERG: Dr. Nussbaum is not alive, unfortunately, but he wrote this based on experience that he has witnessed.

And I can remember that the late Rosalie Bertell also said that a lot of the research that had come forth has been stymied or not used.

So I just want to say that what it boils down to is sometimes your scientist versus my scientists.

When it comes to the World Health Organization and IARC, IARC is a World Health Organization United Nations Agency and are they coming out and -- they certainly have a lot on carcinogens. IARC does a lot of research on various carcinogens. They've named hundreds of carcinogens. And as you know, ionizing radiation is a known human carcinogen.

So we need to look at some of the

relationships to the studies coming out. Why are they not recommending that we stop releasing this stuff into the environment?

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Go ahead.

DR. THOMPSON: The recommendations have actually been followed. The fact that radiation is a carcinogen is the reason why it's being regulated and very tightly regulated.

We've talked about the studies that have been done, the standards that are in place, and the studies on Canadian workers, studies done around the populations around Durham, and we see no evidence of health effects at today's standards and with the ALARA programs in place.

THE CHAIRMAN: Okay.

DR. ROSENBERG: We don't want to continue this debate, because obviously it's not going to be resolved.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Merci monsieur le président.

In the written submission -- I think it's on page 5 or 6 -- it's about multi-reactor design. We had a video on that and that explained quite well what

different step would happen in a case of a major problem. But in the case of multi-units -- because that was just one unit in the scenario -- will there be any incidents on the other units or in the global scenario, Monsieur Tremblay?

MR. TREMBLAY: Just so I understand the question that you're asking me to talk about or us to talk about, the multi-unit design and the implications for ---

MEMBER HARVEY: Yes, because we had that video here ---

MR. TREMBLAY: Sure.

MEMBER HARVEY: --- explaining the different steps that will occur if there is a problem -- a major problem.

MR. TREMBLAY: Okay. I believe we've covered it ---

MEMBER HARVEY: That was for one unit.

MR. TREMBLAY: --- but we'll do it again. Okay. All right.

MEMBER HARVEY: So what -- will there be any incidents on the other units at Darlington?

MR. TREMBLAY: I'll ask Mark Elliott to talk about that issue.

MR. ELLIOTT: Mark Elliott, for the record.

In a multi-unit design, we look at single

unit accidents, we look at the effect of those accidents on adjacent units, and we also look at the full multi-unit common mode accident. So we look at all three of those.

And the way Darlington is designed, and the improvements we're making to the Darlington design, leads to the kind of results that you've seen in the EA.

MEMBER HARVEY: Thank you.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: I guess a little -- I feel that point needs more clarification. What this says really is that the design for Darlington would not be permitted under International Atomic Energy Agency's guidelines. It's on page 6 of the written presentation, one, two, third paragraph down, Darlington multi-reactor design, number one. Maybe the staff could comment.

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

These statements are not accurate, neither are correct.

The IAEA standards or guidelines are being applied in Canada. As a matter of fact, more than often, our regulatory requirements surpass the IAEA standards. So the Darlington site has -- was built and still is operating above these standards. So this is being presented now as "a myth" because, every agency is

reviewing post Fukushima, the lessons learned, to include multi-unit sites. So that for someone to say that we do not meet international standards, that's not true.

The CNSC regulatory program and oversight requires the licensee to review their safety case on a periodic basis and post the lessons learned or Fukushima. We want to extend review of the safety case of each and every reactor to include the multi-site unit.

THE CHAIRMAN: Thank you.

DR. GOLDIN ROSENBERG: Just ---

THE CHAIRMAN: Yeah, you actually have the last word here.

DR. GOLDIN ROSENBERG: Yes, okay, thank you. Well, just to respond to that. This comes from the Canadian Environmental Law Association who do thorough research on their documentation. I don't know that they would publish something and put this in their document that they did -- this consortium that they -- of -- and there's a whole list of people who agreed to this. So I would suggest that you check with CELA, the Canadian Environmental Law Association because their evidence is what I've taken this information from.

And I would like to just close by adding that -- what I didn't in my submission, but on the larger global picture, the CANDU reactor, the spent fuel from the

CANDU reactor process produces weapons grade plutonium. India and Pakistan made their weapons from Canadian technology and I wonder if any of you have read Paul McKay's book on nuclear -- on this nuclear sort of secret that people are not aware of, but I would urge you to read his book because it is full of information about the whole Canadian process and the spent fuel. And Gordon Edwards will probably talk about it tomorrow too because he's the one who first highlighted this for me.

In closing, what I would like to just say is that as a grandmother and as a health person I'm very concerned about future generations and as you -- as many have said, we really implore you in the CNSC panel to not allow the refurbishment of the Darlington reactors. I implore you to think of your humanity. Think of your responsibility to your own health, that of your own families, and the future of all life on this earth. Remember, that it's routine emissions of the radio nuclides and it's not just the accidents.

And in closing, I want to say a quote from Margaret Atwood who said:

> "Powerlessness and silence go together. We in this country should use our privileged position not as a shelter from the world's reality but

as a platform from which to speak. A voice is a gift. It should be cherished and used."

Please use yours to prevent the refurbishment of Darlington. Thank you very much.

THE CHAIRMAN: Thank you. We will take a 15 minute break, that'll bring us to quarter to seven. Thank you.

--- Upon recessing at 6:30 p.m./
L'audience est suspendue à 18h30
--- Upon resuming at 6:44 p.m./
L'audience est reprise à 18h44

THE CHAIRMAN: Okay, we are ready to go. So ---

MR. LEBLANC: Do this one?

THE CHAIRMAN: No, go ahead.

MR. LEBLANC: So the next submission was from the National Farmer's Union Waterloo/Wellington Local. They've informed us of their inability to be here this week and have asked that their submission be treated with other written submissions.

Mr. President, the next submission please.

THE CHAIRMAN: Okay, the next submission is

an oral presentation from Dr. Adler as outlined in CMD H13.177. Dr. Adler.

12-H13.177

Oral Presentation by

Judy Adler

DR. ADLER: Hi, thank you very much. I know you've been here for a long time and it's been a long day and it's the third. I'm sure it's getting to everybody and everybody's stomachs are growling so I'm going to try to make it as brief as possible because many of my points have been brought up by other people.

I live in Toronto at Sinclair and Dufferin where I've been practicing chiropractic for the last 25 years. I have a Bachelor of Science in Neurophysiology. For the record, I want to register my opposition to the refurbishment of Darlington and its relicensor (sic).

I am not representing any particular group but I -- from other deputants I know that my sentiments are shared by many, and like many I've become concerned about nuclear energy since Fukushima and I think this is a recurring theme around the world.

Although the OPG staff, nuclear scientists, engineers, waste disposal people, I am very convinced

after these hearings that you are doing the best job that you can and that we're in excellent hands. The thing that disturbs the public is the ALARA. I think what I'm hearing is that no one can reassure us of zero risk, and in, like I said, post Fukushima, post 911, weather changes, we're all concerned.

Everything has an inherent risk and one of the presenters before me a couple of days ago said that, and truly driving here is a greater risk than anything happening at the plant. However, if I have an accident, I kill myself, I kill another person, maybe two more people, but the concern that we have is that if anything happens, the devastation is great. So the comparison that the gentleman made to the risk of driving a car to the risk of running a nuclear facility so close to a dense population is wrong.

Three weeks ago, after I signed up for this, I discovered that in my neighbourhood, at Sinclair and Dufferin, ten blocks away and within sight of my son's school, is the GE Hitachi plant. This plant is responsible for producing uranium pellets. For the production of these pellets, which is part of the nuclear fuel cycle, 2,000 tonnes of uranium powder are being driven through the heart of Toronto, through my neighbourhood.

How can this be safe? I don't -- I'm not a nuclear scientist, but this defies common sense. Why is uranium being ground up in Port Hope, transported in trucks to the heart of downtown Toronto then back to Peterborough and then to Darlington? Someone needs to explain this to me because I don't understand it.

Public safety should be paramount. Darlington and the GE Hitachi plant should be decommissioned and at the very least moved to Youhopeitsville, some remote populate area. Canada is the largest -- third largest country in the world. We have lots of land where there is nobody yet.

Pickering, Darlington, GE Hitachi are right next to dense populations. I understand, and correct me if I'm wrong, but Pickering and Darlington are the closest nuclear reactors in the world to high population density. This to me makes no sense.

The other problem that I have, and this has been brought up by many people, is nuclear energy equals clean energy, and I hear these young people saying the same thing. What's so clean about radioactive energy and why are we so concerned about burying it if it's so clean? We agree that it's dangerous and should be handled with great care and that it costs a lot of money. I think we all agree on that and yet we want to produce more. It

makes no sense.

I don't have to harp on the point that it remains radioactive for blah, blah, blah, blah, blah and we'll all be dead blah, blah, blah, blah, blah, and people will still be worried about the risk of radiation.

We can't -- yeah. The other thing that doesn't make sense to me is in the last 50 years of nuclear energy, we have produced waste that's going to be around for I've heard quotes from a thousand to a million years. This is just an equation that just doesn't work.

Solutions lie in decentralizing power production. We can’t continue supplying larger and larger grids. The population is growing. The grids are getting bigger and bigger. Every time there’s a blackout in wherever, millions of people suffer, worry about how they’re going to heat their work or feed their children.

We need to make consumers responsible for producing a percentage of their own energy. The billions we spend on the nuclear industry can be redirected to solar, geothermal and wind industries, and you’ve heard this over and over gain from other deputants. I wouldn’t be surprised, if we took all those billions, we could probably provide free solar panels to people.

We need to focus on building houses and buildings which are self-sustaining, and we need to

decentralize power production. This is great for the social fabric and the sense of well-being of the citizens and we know it’s good for the economy and society and gives our children hope instead of fear.

Whether anything ever happens in Darlington –- and I hope it never does and probably never will –- the fact remains that the general population is afraid. Public awareness campaigns are very effective in changing people’s behaviour, as witnessed by the “Don’t drink and drive” campaign. Power Down Ontario public awareness campaigns to reduce energy consumption should be more aggressively pursued to change Ontarians' large energy appetites and habits.

Given people’s concern for their part in the degradation of our environment and the widespread anxiety about nuclear power, there has never been a better time to change our energy consumption habits. Germany, Switzerland, Quebec, Belgium are decommissioning their nuclear plants. We can too.

In summary, Darlington and its nuclear field production are too close to human habitation. Shut them down or move them.

(APPLAUSE/APPLAUDISSEMENTS)

DR. ADLER: Radioactive waste remains dangerous for far too long. Stop producing more.

Decentralize power production by providing everyone with backup solar and/or wind. Give us local power security. PR campaigns to reduce consumption? Power down Ontario.

In closing, I first have a question for your individual consciences. If each and everyone in this room who works for the nuclear industry and on the Commission was personally liable should an accident occur in either the transportation of materials or the production of fuel or the generation of nuclear power or the long timelines of the disposal of deadly radioactive waste, would you still run this plant?

And I don’t want anyone to answer the question, but I think you all need to think long and hard about that one.

THE CHAIRMAN: Are you finished?

DR. JUDY ADLER: I told you we it was going to be short, yes.

THE CHAIRMAN: No, one time, I was --

DR. ADLER: Everything you've heard.

THE CHAIRMAN: Thank you.

Questions?

I think the GE transportation is a bit off-topic, but since you mentioned transportation, I think we owe an explanation of what does it -- the safety issue associated with transporting uranium or yellowcake,

whatever is being transported, through major cities.

DR. ADLER: Yes, it’s yellowcake.

THE CHAIRMAN: Please, somebody?

MR. JAMMAL: Ramzi Jammal, for the record.

The transportation of nuclear material is regulated by the CNSC under our Packaging Transport Regulations. There is no package that is used for transportation that’s -- there are multiple types of packaging, let me start with this, and the package are either approved or certified by the Commission. However, regardless of the package, the inherent safety of the transport is built into the package. And the package has a dose rate by which that the packaging cannot exceed in order to provide protection for the public and the environment and the workers.

And those values are internationally known, they are bound by everybody, and then the CNSC applies that regulation.

So, with respect to the transport of uranium, they are in an approved packaging and the transportation is extremely safe.

This transportation methodology is not unique to the CNSC, it’s based on the international regulatory requirements of the IAEA and it’s being applied in Canada.

DR. ADLER: May I?

THE CHAIRMAN: Go ahead.

DR. ADLER: I attended a meeting with the GE-Hitachi plant, and this is a little bit off-topic, but it relates to the safety, I was informed that this plant is allowed a maximum of 7,000 kilos of uranium to be dumped into the sewage. A maximum. Now, they’re only at 10 kilos a year.

But what kind of safety are we talking about when they're allowing those kinds of numbers and they’re allowing up to one kilo of uranium power to be admitted through the stacks?

THE CHAIRMAN: Okay. Now, you’re really out of scope and the reason is because GE people are not here. ---

DR. ADLER: Right.

THE CHAIRMAN: So really it is not our procedure.

DR. ADLER: But it’s regulated by you guys.

THE CHAIRMAN: Absolutely. And ---

DR. ADLER: So you guys should be able to answer that.

THE CHAIRMAN: But the licence that we've awarded, by the way, was after a public hearing that was advertised in Toronto.

DR. ADLER: For one day.

THE CHAIRMAN: What can you ---

DR. ADLER: In one ---

THE CHAIRMAN: Or no use ---

DR. ADLER: One ---

THE CHAIRMAN: It doesn't matter. But nobody -- nobody -- what I'm trying to say is there was an ample opportunity for everybody to discuss and there will be other ample opportunities to discuss this when we are actually talking about a licence or a licence application.

DR. ADLER: Okay. Thank you for that.

With all due respect ---

THE CHAIRMAN: Ms. Velshi?

DR. ADLER: --- I just want to answer one thing.

THE CHAIRMAN: No, no, just a second. You had your piece.

DR. ADLER: No.

THE CHAIRMAN: Let the Commissioners ask some questions. You'll have the last word.

DR. ADLER: All right.

MEMBER VELSHI: Question for CNSC staff. The intervenor has mentioned that the Pickering and Darlington stations are perhaps the two nuclear stations closest to a high-populated area. If you can please

confirm whether that’s the case?

And I know that currently there is no standard on population limitations and sighting of nuclear stations, but whether in Canada, whether at the international level, there are any thoughts on that front, I’d like to hear on that, please.

MR. WEBSTER: It’s Phil Webster, for the record, Darlington Director.

There are no statistics on which station is near a populated area. And, of course, there's no real definition of what is a populated area. What I can say, from my own experience, there's a station in Northwest England, the Heysham, which is practically part of the town. So it’s not unusual around the world for stations to be close to population.

THE CHAIRMAN: How far is Indian Point in New York? It thought that Indian Point, again, was really close to a very, very highly density towns. Do you know?

MR. WEBSTER: Going from memory -- it’s Phil Webster -- I think it’s about 50 kilometres from downtown New York, but of course the distance from the edge of New York City is much less.

THE CHAIRMAN: Fifty (50) kilometres from downtown New York, that’s pretty close to New York. Right. Okay, anybody else?

MEMBER VELSHI: And I did have a second part to my question. It was, is there any thought of putting any standards or limitations around sighting of nuclear power plants to highly populated areas?

MR. WEBSTER: Phil Webster, for the record.

My VP's reminding me that it’s a safety case that demonstrates the overall safety of the plants.

What I would say, and it's beyond the scope of the EA or the licence renewal hearing, is that our -- the reports of our Fukushima Task Force, and also the recommendations of the Joint Review Panel for new build, did recommend that the issue of land use planning control on population growth be looked at.

THE CHAIRMAN: Thank you.

Anybody else?

Okay. You’re now the last one.

DR. ADLER: Just two things. One, I’ve lived in this neighbourhood for 20 years, in downtown Toronto, and nor I, nor my neighbours, have ever known about this plant up until three weeks ago.

The public notice that was put out was in one paper for one day, it’s insufficient, as witnessed by the population around it that knew nothing of its existence.

In closing, I’d like to say this. This

could be a moment in history for all of us here. I'd like to end with a prayer. I pray to the powers that be to keep the minds of the Commissioners open, their hearts courageous so that they may decide this complex issue based on wisdom that looks not only to science, but to the social issues and to the future of our childrens' childrens' children.

Thank you for taking my opinions into consideration.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you. I think that we are now into the last submission for today -- oral submission, I meant to say. And it is by Greenpeace, as outlined in CMD 12-H13.181 and H13.181A. And I understand that Mr. Stensil will make the presentation.

12-H13.181 / 12-H13.181A
Oral presentation by
Greenpeace

MR. STENSIL: Good evening. Ma presentation ce soir va être en anglais, mais s'il y a des questions en français, je suis content de les prendre.

Thank you for this opportunity to speak to you today. A member of CNSC staff said to me last night,

you're on last of the third day of the hearings, you better be entertaining. After three days of hearings I'm tired as well so I empathize with the fatigue that you're feeling. And while it is not a requirement under the Canadian Nuclear -- or the *Canadian Environmental Assessment Act*, I will do my best to keep my adrenaline flowing to provide you at least with a dash of entertainment to keep you engaged.

And I'd like to keep you engaged because Greenpeace is deeply concerned with the emissions from this environmental review.

As you know Greenpeace has participated in the reviews of Bruce A, the Pickering B life extension, Point Lepreau, et Gentilly-2. For this review, the CNSC has taken a step down in terms of rigour and public engagement. This is extremely disturbing in light of Fukushima. And my presentation tonight will focus on how the potential impacts and the measures that would be needed to mitigate those impacts for large accidental radiation releases have not been addressed in this environmental review.

The CNSC, as you know, has a statutory obligation to consider the effects of accidents from a project. This environmental assessment has not done that. I have listened to most of the discussion over the past

three days and I have found some of the responses to intervenor questions from the CNSC staff and OPG to be a bit misleading or evasive on this front. So to -- from the front, to be very direct, this environmental assessment did not analyse accidents leading to large, offsite, radioactive releases and the resulting environmental, social and economic effects, period.

And this is a concern for emergency planning which would be used to protect Canadians in the event of such an accident. There are no detailed plans for large accidental releases at Darlington beyond the 10-kilometre zone.

Current plans simply hope that authorities will manage with the structures in place and be able to respond in time, but assume that such accidents are of such a low probability they need not make detailed plans. So that clarified, let us begin.

So to summarize the main points of my presentation tonight, first, large accidental radiation releases are a realistic possibility at Darlington according to Ontario Power Generation. I say this based on OPG's own analysis of the accident risk at Darlington. The *Nuclear Liability Act* exists because OPG believes significant accidents could happen. There's been a lot of to'ing and fro'ing about the *Nuclear Liability Act*, but

they require that Act and asked for that act to exist because, in their internal assessment, they see it to be such a risk that they want to be protected from it, period. It's a moral hazard. They're not responsible for their actions.

I also note, through Access to Information, they've been asking the government not to raise the cap too high because they don't like the impact of increased insurance fit fees on their profit margin.

As well, OPG's risk summary for the Darlington also identifies accident scenarios involving large radiation releases. Those accidents have been excluded from this review. If you haven't looked at it, they released this on the day that the draft screening report was released. And it's all we know about the accident risks. But in it, they identify a number of accidents that you would define as catastrophic. As well, the Canadian Nuclear Safety Commission has ignored lessons from Fukushima.

Mr. Harvey, yesterday you asked CNSC how they were addressing institutional failure. And I know I've raised that with the Commission before. This is being acknowledged increasingly internationally as a cause of Fukushima. I was disappointed by staff's response because it was very different from the response they gave

to me on the draft screening report.

In response to me, they said they didn't know how to quantify institutional failure. So there's a significant uncertainty there that they acknowledged. However, when I asked them to simply acknowledge that uncertainty in the screening report, they refused.

Worse still, the CNSC has ignored requests from NGOs, the Government of Ontario, and the Joint Panel Review to review large accident releases. You've heard this before. But it seems that almost everyone believes that there should be a change in the CNSC's approach to accident assessment post-Fukushima, except the CNSC.

Finally, Fukushima shows that the CNSC's current safety standards don't provide socially acceptable limitation of risk to Canadian society. These weak standards should not be used as a pretext to simply ignore potential consequences of an accident.

So Greenpeace recommends that this environmental assessment cannot be approved until an assessment of large radiation releases and their effects is reviewed.

So the *Canadian Environmental Assessment Act* requires responsible authorities to consider accidents in a precautionary manner. As seen by Fukushima and Chernobyl, the continued operation of Darlington could

cause catastrophic and irreversible harm to Canadian society and the environment. When faced with irreversible harm, we need to err on the side of caution.

In essence, the diagram you see on screen, in my bad designing abilities, attempts to show how the CNSC approach to accidents and malfunctions in this review is divergent from observed reality.

As was stated over the past two days, CNSC staff decided in 1998 to use the global safety goal of one in a million or 10 to the minus 6 as a cut-off for assessing consequences for accidents. This cut-off is represented by the arrow in the middle of the screen.

According to global international safety standards, we would witness a major nuclear accident about once every million years of reactor operation. The arrow to the left, however, represents the real world occurrences of such accidents. It’s much more likely than safety goals. We have about 14,000 years of cumulative reactor operation internationally and major accidents are actually happening about every 3,000 reactor years of operations.

So what does this mean? This shows a significant amount of uncertainty between the theoretical, made-up safety goals used to reassure the public that reactor risks are reasonable and that of real world

experience. If we were to approach accidents in a precautionary manner, we should acknowledge this significant uncertainty. This review does not.

One of your staff explained to me the choice of the 10 to the negative 6 cut-off probability as follows, generally, I'm paraphrasing, "We looked at the probability of a major accident and we pushed it out one magnitude farther to be safe."

As shown in the last slide, the level of uncertainty between real world reactor accidents is about two or three levels of magnitude different. That's significant. Knowing this, if the CNSC wanted to acknowledge this uncertainty while still using your probabilistic approach, which I don't necessarily support, you could push your cut-off probability to the 10 to the negative 7 or 10 to the negative 8. Within your framework, this could acknowledge the uncertainty shown by Fukushima and in your own modelling.

I would like to suggest to you today that this should be done before this environmental review is approved. According to Ontario Power Generation's risk summary, here it is again, an accident causing a large radioactive release has a predicted frequency of approximately 4 to the negative 7. The definition of large release is an accident that could cause the

abandonment of land. Sounds like irreversible harm to me.

And these large accidents lie just beyond this 10 to the -6 threshold chosen by the CNSC. So if part of the original reason for choosing 10 to the negative 6 cut off was indeed based on choosing a probability of a major accident and then pushing it back to be a little safer, perhaps in light of the uncertainties shown by Fukushima it should be done again.

What’s more if you examine closely OPG’s Darlington risk review it originally found Darlington to have a predicted frequency of large radiation releases around 5 to the -6. That’s what it’s operating about right now actually.

This would be considered credible and such accidents would be included in the current review. That would have allowed an assessment of the adequacy of emergency plans to deal with large radiation releases. This review would have had very different conclusions on environmental effects.

What did OPG do? OPG changed the assumptions of its risk review in order to push large release accidents out of scope.

I think this shows two things. The 10 to the -6 cut-off probability is vulnerable to gaming - maybe that's a harsh word - by the proponent to avoid scrutiny

of accident effects. I assert we're seeing this in the current review.

Number 2, it underlies the inherent uncertainty in OPG's risk assessment. Arbitrarily change a few assumptions and you come out with an incredibly different result, garbage in, garbage out.

All that is to say, large accidental radiation releases have been identified by OPG in its risk review. They are realistic, but they have been excluded from this review.

This review to me shows that the CNSC has not admitted it's policy towards accidents in environmental reviews is no longer socially acceptable or supported by international evidence post Fukushima.

You've heard interveners ask for large accidents to be considered in this review over the past few days.

In light of Fukushima, the joint review panel recommended the emergency plans in Darlington be tested against simultaneous radiation releases from all reactors of the site, no matter the probability.

In our comments on the scope of this review, Greenpeace requested this recommendation be implemented. CNSC staff and the Commission which approved the scope in a closed door meeting unlike past

refurbishment reviews, refused to implement this recommendation. So this was your choice.

This raises huge questions about the Commission's accountability for someone like me who has tried to intervene constructively in these reviews.

And finally, Emergency Management Ontario asked you to look at more extreme events up to 10 to the -7. The CNSC said no. The CNSC has said no to Civil Society, the Joint Panel Review and the Ontario Government.

The world is telling you that post Fukushima business as usual is no longer acceptable. Please listen.

So where does this get us? On screen, you'll see my diagram again. It compares the real world occurrence of accidents with the CNSC's arbitrary cut-off and the request by Emergency Management Ontario to look at more extreme events up to 10 to the -7 so in between 10 to the -6 and 10 to the -7 that's where large releases are mainly focused in OPG's risk summary.

It's just over the line and we're not looking at it in this review despite all of the uncertainties. The precautionary principle when there is irreversible harm and you're aware of uncertainty, you address that uncertainty.

There are huge uncertainties which aren't acknowledged in the screening report about these numbers. I asked for the uncertainties to be addressed in just the wording of the screening report - CNSC staff refused.

These accidents should be assessed in this environmental assessment. We also need to look at whether the detailed emergency plans are sufficient to cope with such accidents over the life of the project.

I must say that compared -- comparing this environmental review, it is much less thorough compared to the Pickering life extension.

In that EA environmental planning -- emergency planning for accidents was examined over the life of the project until 2060. This also considered population growth which is significant around Toronto.

This EA for some reason lowers the bar and only looks at accidents and emergency planning until 2030 for only small accidents.

I find it hard to fathom how you could permit lowering the bar on safety -- on the safety of Canadians post Fukushima.

In closing, I saw Fukushima last year, I stood 30 kilometres from the station on screen and I could detect caesium on the ground where people were living.

I saw a society that is going through

dramatic change because of Fukushima. Greenpeace didn't used to be popular in Japan by the way; it is much more popular now.

From my perspective, your environmental assessment misrepresents the risks of continuing to operate Darlington. That needs to change.

In conclusion, large radioactive releases are a realistic possibility at Darlington. This review has not assessed the environmental, economic and social effects of such accidents.

The CNSC is required under CEAA to assess projects in a precautionary manner. You are required to examine the environmental effects, the consequences of accidents under CEAA.

Based on the available evidence and on the basis of this inadequate screening EA, I submit that the CNSC cannot reasonably conclude that the Darlington project will not cause any adverse environmental effects.

To the contrary, given the extensive uncertainties and the likelihood of adverse environmental effects as well as the large amount of public concerns raised to this point I submit that the CNSC must refer this project, the environmental review, to the Minister for referral to a panel under CEAA.

That concludes my remarks. Thank you for

listening. If you have lots of questions I hope there's coffee.

(LAUGHTER/RIRES)

THE CHAIRMAN: No there's not. Not until you answer the questions.

MR. STENSIL: We get a carrot to get to the other end of questions.

THE CHAIRMAN: Okay thank you. Who wants to start?

Okay I'll bite. You know, you've got to help me. I don't know if you've seen the video that staff put out. I think that we all accept that accidents do happen. That's not our concern.

We -- I don't care what level it is, -7, -8, -10. The concern is what happen and will you be able to shut it down.

Even if the plant is ruined, even if the plant is melted, as long as you can prevent, at extreme, release of radiation. That has always been our concern. Post Fukushima that's all we've been doing.

So help me try to understand. I'm not too crazy about this -6, -7 myself, but definitely we want to make sure under any incident, no matter how severe, the machine shuts down. What am I missing here?

MR. STENSIL: Thank you for the question

and it will hit on a few things.

First of all I would urge you to look at OPG's risk summary. So in OPG's risk summary, they say that they identify accident scenarios where large amounts of radiation could be released into the environment.

One of these accident scenarios includes the estimated radiation release would lead to 3,000 latent cancer deaths and the abandonment of land. So that's according to their own risk studies. So the possibility is there.

So the next question is, that's -- it's been excluded based on this 10 to the -6, 10 to the -7 that you're not too interested in.

With Fukushima, you made the movie on about how a Tsunami won't be able to hit the plant, we won't lose our back up power, but as Mr. Jammal said yesterday, it's becoming increasingly acknowledged the Japanese were aware that that Tsunami was realistic.

They ignored their own studies that said you should build a 15 metres high Tsunami wall to stop it.

That is what I raised at the May 3rd meeting when I said you need to look at institutional failure as a cause of Fukushima, not simply the series of triggers that will lead to radioactive release because we're humans; we can't foresee all of that.

But with Fukushima they knew about it, they ignored it because of human hubris perhaps, and that lead to the accident.

What we haven’t done yet in Canada, in your Fukushima review that I asked you to do, was to actually look at -- beyond making the plant more technically robust, what are ways that we could – what other policies and procedures that we would put in place that are transparent that could minimize the risk of institutional failure here in Canada. And we haven't done that.

THE CHAIRMAN: So two things that I need some clarification in.

First of all, what is this report that the intervenor is talking about? Did the staff see it?

And secondly, I'd like a rebuttal by the fact whether we actually not have taken any severe accident possibility in the so-called movie that we just saw today. No, Monday. I can't keep track of time here.

So I want to start with OPG.

MR. TREMBLAY: Yeah, Pierre Tremblay, for the record.

So I'm going to ask Mark Elliott to talk to the specific report that Shawn is referring to. And I guess what I would say is that, you know, there needs to be some kind of a planning basis for analysis, and that

basis was used. But maybe it's lateness in the day.

I actually agree with him that, you know, events could happen. So to say oh, it's not going to happen, you know, that's not a very good way of proceeding.

So we aren't doing that. We're saying, "Yeah, it could happen". And so however improbable, what are the steps we need to take to secure our facilities.

I mean, that's an issue not necessarily for refurbishment. It's an issue every day in terms of how we operate and manage the plant.

So let me ask Mark to talk about the report and specifically what we're doing with it.

MR. ELLIOTT: Mark Elliot, for the record.

During the time frame of preparing the EA, something else was going on. We were under licence condition for S294 for Darlington to implement the Darlington risk assessment, probabilistic risk assessment.

It was kind of happening at the same -- in the same time frame.

So when we completed the risk assessment for S294, we summarized it in a 104-page document and we put it on our website. It's there now. I checked today.

And it lists the results of that assessment, and that's what the intervenor is talking to.

A couple of things happened when we went through that in preparing for this, and I agree with Yolande Akl, who said we use these risk assessments to look at where we can make adjustments and add safety and get a good benefit. And that's what happened when we went through this.

We realized that with these four safety improvement opportunities that I talked about, the containment filter venting being one, and the other three, we would -- we could impact safety quite a bit and we could lower the risk of this severe accident and the station blackout into the 10^{-8} range.

So that's what was -- one of the results of this work. But we did publish it, summarized it and put it on our website.

THE CHAIRMAN: Staff?

MR. JAMMAL: Ramzi Jammal, for the record.

I'll start at the high level and I'll pass it on to my colleagues with respect to details.

What you just heard, let me give you a global perspective. I've been saying for the last couple days is we always look for enhancement, and this PSA analysis in this report is an indication on how the CNSC requires our licensees to keep updating requirements according to our regulatory requirements.

So the CSA standard that's been imposed upon OPG to review the probabilistic safety assessment is a new requirement, and Darlington is in full compliance with the CSA standard.

I'll pass you on to Dr. Thompson.

Oh, sorry. I've been corrected. It's a CNSC standard. It's S294. Not a CSA standard, so thank you.

DR. THOMPSON: So Patsy Thompson, for the record.

Essentially, the work that was undertaken for the environmental assessment is in parallel to the work that has been undertaken following the Fukushima lessons learned and the task force reports.

When we looked at the environmental assessment, the environmental assessment is not being conducted for the current plant. It is being considered -- it is for the operation after refurbishment.

And so what OPG did was look at the various accident categories, taking into consideration the results of the integrated safety review, and identifying plant improvements that were going to be put in place. And we -- those improvements were credited and the risk categories, the risk assessments were redone considering the risk improvements, the safety improvements.

With those safety improvements, the risk category that corresponds to the -- one to the -- one in a million risk category is a beyond design basis category which was used for the environmental assessment.

The environmental assessment requirements under the *Canadian Environmental Assessment Act* is to assess the consequences of an accident that may happen. In the context of an environmental assessment, emergency measures are considered a mitigation measure if there is an off-site release, and that's what we did for the environmental assessment.

But that's not to say that in licensing and moving forward for looking at refurbishment and post-refurbishment licensing the EA is used as a planning basis. The work under the safety improvements will continue, and my colleagues can speak to that. And also, the lessons learned from Fukushima will continue to be implemented.

But for the purposes of the EA, we looked at the plant in a post-refurbishment -- refurbished state, taking into consideration the safety improvements that were made.

THE CHAIRMAN: If you had to integrate that report, what -- I'm trying to understand what would happen if you had integrated or could integrate this OPG report

into the EA. What would that do?

DR. THOMPSON: Patsy Thompson, for the record.

That's exactly what was done, so what was described by OPG is -- the safety assessment was conducted. It's been posted. And then the work took into consideration the safety improvements and the risk category -- the risk was reassessed.

THE CHAIRMAN: But the intervenor is saying that you did not take this into account.

DR. THOMPSON: We didn't, so the ---

THE CHAIRMAN: Okay. So ---

DR. THOMPSON: So the table that Greenpeace has provided has three columns. It has the column with the release categories, then it has three columns; baseline predicted frequency, enhanced model with safety improvements and then the enhanced model without the safety improvements.

And so what CNSC staff did for the EA is so the baseline is the result of S294 and then we used the second column for the EA, which is S294 plus the safety improvements.

MR. TREMBLAY: Pierre Tremblay, for the record.

Just ---

DR. THOMPSON: And I think Ms. Akl can explain this technically better than I can.

THE CHAIRMAN: I don't know who should go first. You want to direct -- I want to hear Ms. Akl first and then you'll have an opportunity.

Okay, go ahead.

MS. AKL: Yolande Akl, Director of Safety Assessment and Reliability Division.

I just want to add to what Dr. Thompson said about the -- how we select the screening criteria for selecting the 10^{-6} per year, what does this mean.

Given that we have the safety goals for large releases for existing reactors is 10^{-5}, this means that the screen out accident sequences that contribute to less than 10 percent to the large release. So in other words, we screen out those sequences with frequencies one order of magnitude lower than the safety goal set by the IAEA.

THE CHAIRMAN: Again, I'm trying to find a very -- I'm not sure I follow all of this.

But what -- EMO did ask for the 10^{-7}, right, if I recall what they asked for?

DR. THOMPSON: Patsy Thompson, for the record.

The letter from EMO is attached to CMD

H13.A, which is the supplemental CMD, so EMO did not ask the CNSC to consider an accident of one in a -- 1 times 10^{-7}. What they did was to ask that we consider the same type of accident that was considered in Pickering B.

And so our supplemental CMD in Section 2.1 explained that that's what we did. For Pickering B, we didn't ask OPG to consider an accident that was in the minus seven category. We looked at what OPG had done and what we considered was that with the scenarios they had identified, the CNSC staff felt that there was not sufficient conservatism in the accident they had chosen. So we asked, we requested that the assessment be done with the next category.

THE CHAIRMAN: Okay, go. Push the button.

MR. STENSIL: Thank you. To start, let’s put this in the frame of, not the CNSC standards, but the statutory responsibility you have under CEAA right now which is to identify and look at the effects of accidents that may occur. I think what I was saying is OPG’s risk study identifies a number of accidents that may occur, ok? And it’s right here, so what you were saying, we actually agree, President Binder. We want to know what happens in the worst scenario. We have a few, according to OPG’s numbers, what would happen. They’re not just -- they’re just not considered in this EA.

In regard to what EMO asked for and this 10 to the negative seven number and what happened with Pickering, I actually had something to do with that. During the Pickering environmental refurbishment review, unlike this review, there was a hearing on the scope of the environmental review. Now this is a document that actually I will take credit for that it’s public is I made a lot of noise around the Pickering environmental review that we had no access at all to any of the probabilistic risk numbers that were used to bound these EAs. It’s basically you built on trust that we’re going to exclude all these accidents.

So since then, OPG has started to release these summaries. We just got this summary the same day that the environmental draft screening report came out and, for the record, I was told that the stakeholder consultation meeting in September of 2010 by Ms. Swami from OPG that they would not release this, but it was released, so thank you for that. This document for Pickering, we did not have available at the time but I was doing access to information requests and was able to get a hold of correspondence between the CNSC and OPG where staff were saying, you have not included external events in your PRA for Pickering and when I looked at the little table that was there, there was one accident that was on

the line and external events as we know from Fukushima are one of the biggest contributors to risk.

I raised this at the Scoping hearing and the staff made a decision that even though the number was specifically in the report, I don't know, it was like five to the negative seven, that because of the uncertainty because they had excluded external events, they would make it a credible accident for the purposes of that review and because of that what happened was that the review, that accident scenario would have triggered provincial emergency plans and the review had to do a lot of consideration of whether those plans were adequate. That was a good thing to do.

In this environmental review, what I'm raising is that so the fact that OPG had excluded external events when for about a decade it has been a global standard that we should have external events in PRAs, it seemed a little suspicious to me. This is where I'm getting at the gaming thing is it's really easy by just doing some data trimming to move that number over this threshold. And I don't think that's fair.

In this review what I can see is there was one major accident, the huge one where there would be 3,000 latent cancer deaths that came out as realistic and what happened is they changed that and they've managed to

lower the predicted estimated probability now with modelling changes and then future design changes, I think it's to 10 to the negative seven or 10 to the negative eight somewhere, but the summed large release frequency for the station is still 10, like four to the negative seven. That's my point.

And there's one disaggregated accident scenario that is also a large release scenario where radioactive releases happened within the first 24 hours that is there. So under your statute of CEAA where you'd need to identify accidents that may happen, OPG has identified two accidents that are not considered within this review and they pose arguably very irreversible harm to Canadian society potentially. They should be assessed and we should be looking at whether emergency plans would be able to cope with them. That's my point.

THE CHAIRMAN: OPG?

MR. TREMBLAY: Well, Pierre Tremblay for the record. I'll ask Mark to talk about the details. I guess I would simply say that, you know, setting the statistics aside and I respect 10 to the minus six, minus seven, minus eight, whatever. You know, we recognize that things could happen. There's uncertainty associated with it all. And so, you know, we've responded to that by taking a close look at this, analysing the lessons from

Fukushima and establishing some real tangible positive safety improvements to reduce the risk and to avoid a severe accident. We understand the nature of it. We haven't, you know, shirked away or gamed. We've dealt with the issue and, you know, on that score, we've been very vigilant and involved with the Fukushima follow up. Heck, I've even led some of the industry reviews into this, so, let me just ask Marc to talk about the specifics again.

MR. ELLIOTT: Yeah, Marc Elliott for the record, just a couple of things. When we do an EA, it's being done on a project and the project that it's being done on is the Darlington refurbishment project and continued operations and we made a decision that that project would include these safety improvements. It would include the containment filtered venting. It would include the 30 pg and the other two that we've added. So that's what we did the risk assessment on because we were doing the EA on that project. So that's what we were required to do. I want to make that clear and that's why the numbers came out the way they did.

The other thing I would say is that, you know, with all this talk about the PRA and numbers, it worked because we found these four ways to add real safety and we made a commitment before Fukushima to scope them

into the refurbishment and were going to do them and actually were going to do them before the refurbishment. So I understand that kind of a discussion around the numbers but in fact, it worked.

THE CHAIRMAN: So again, I -- I'm still not there. I look at it from a completely different way. What I want to know is what is a scenario that actually will result in a release? I'm still not there because they, according to the improvement that I've been hearing about, with all the offsite facility, with all the mobile facility, with all of that, I just don't see a scenario where you're going to give a last release before they can shut down the machine which, so, I don't care about the statistic. All I care is is there a scenario where they will not be able to shut down the machine?

MR. STENSIL: The point, President Binder, it's not about the statistics and it's not about specifically will they be able to shut down the machine. OPG's own study shows that there will be -- there is the potential for large radioactive releases. That is an environmental effect that may occur. That's in their document. I haven't made that up. It's right here. They haven't denied that.

THE CHAIRMAN: Described in scenario?

MR. STENSIL: Yes, so I would ---

THE CHAIRMAN: A specific scenario as to how it came about ---

MR. STENSIL: Yep ---

THE CHAIRMAN: With this release?

MR. STENSIL: Exactly.

THE CHAIRMAN: So that's what I'd be interested in reading, would this scenario actually cause a large release?

MR. STENSIL: They haven't eliminated risk ---

MR TREMBLAY: Pierre Tremblay for the record, you know, I guess what I would say is the issue here is, you know, that whether it's an analysed scenario or not an analysed scenario, things could happen, and that means not only do you have to have this mitigating equipment, but you need to be prepared and the video pointed this out very well, to act and to respond to an event should it occur.

So it may be to that point. I'll ask Laurie Swami to talk a little bit about that aspect of it because really, that's the natural transition to this discussion.

MS. SWAMI: Laurie Swami for the record. I understand all of the discussion we've had from an EA process. I agree with Dr. Thompson's comments with

respect to the planning tool, looking at possible mitigation, so if we take that one step further, one of the mitigations that's available is to implement the emergency response plans. And we've talked at great length already about the 5.7 millisieverts at the 1 kilometre level and we've talked about the sheltering that we've -- that has been fully assessed in this environmental assessment. In addition to that, we have assessed what the evacuation would look like should there be one in the Darlington area and you'll see that in our technical support documents on human health.

We've actually discussed that. We've included in our assessment the evacuation time estimate studies very similar to the work that we did on Pickering when we looked at the nuclear accidents. So all of that work while I understand that it's not as -- not in the same way that the sheltering was because that actually was included in the final environmental assessment report. We do have a discussion of this.

We do talk about evacuation and we do talk about the effects that that could have on the community, as well as in the environment. So I think that is covered in our work.

And from an accident analysis itself, I agree also with Mr. Elliott's comments that this is the

process that we're in, where we do studies. We look for improvements and we implement those improvements, and that is what we're talking about today.

I hope that answers your question. I'm not sure I was as short and brief as I could have been.

MR. STENSIL: This is an important discussion. I would note that in my -- I was worried about this when we were at the scoping stage of this environmental review. One of the requests that I made, based on the Pickering experience, was that there be a separate meeting of the Commission just to discuss what accidents would be included within the review so that this could be hashed out and there could be thorough understanding with this document on the table, which clearly you haven't seen yet, President Binder, on what those accidents that may occur OPG has already identified.

And OPG has identified two, Release Category and Release Category 2, that are of a large release frequency. They're just over the sixth line. It depends on what they play with their modelling, but there's uncertainty involved that I've highlighted.

They have, despite all the upgrades -- I see where you're going with your questioning -- despite all the upgrades they proposed so far, they have not been able to eliminate the possibility that there would be

radioactive releases, so there still is the potential for an environmental effect that, under your statutory responsibility right now, should be assessed.

That said, I would really encourage you to look at this document specifically, because it was produced by them. It took a lot of fighting by me to get these documents published.

I would also have you know that through provincial Freedom of Information, I have personally tried to get a hold of the source term, which we have a limited source term for RC-7, Release Category 7 in this review.

When you have source term, you can do modelling to actually assess whether emergency planning would be adequate, but I've been refused that by Ontario Power Generation.

So it is this environmental review where we would have access to that, and I'm asking the Commission -- OPG has identified an environmental effect that will impact on Canadians, that we have a thorough review of that within the scope of this environmental assessment.

MR. JAMMAL: Mr. President, if you allow me, sir, I want to try to take an attempt at this without the numbers or anything.

The study that is out is identifying a release. We agree that there is a release.

Now, as part of the design change for this refurbishment, the improvement that's taking place, that is what we are talking about right now. So with the improvements that's going to be installed as part of the refurbishment or even before the refurbishment is going to be done, that's the release that's going to -- the added mitigation measures is going to protect and provide mitigation for that release.

So I'm trying to give it without going through the numbers. So in summary, this was done without any improvements.

Now, once you put the improvements in place, that is going to be the release.

I'll pass it on to Mr. Frappier if he's got anything else to add.

MR. FRAPPIER: Perhaps just real quickly, Gerry Frappier, Director General of Assessment and Analysis.

So the report that Mr. Stensil is making reference to, we are very, very aware of. We've gone through it in detail. In fact, it is an outcome of the process that CNSC has put in place with the requirement of S-294 and the creation of a detailed probabilistic safety assessment.

The reason for that and as was mentioned by

OPG, the demonstration that it works is exactly what we're talking about here, a release category that perhaps was possible, although very, very, very unlikely, through this process, has now been shown to be something that OPG has now put a design fix in place.

So whereas when that report was released that Mr. Stensil is making reference to, OPG had that as one of the potential release paths.

With the design changes that are going to be put in place as part of this enhancement to the facility, that is no longer considered a possibility and it is no longer one that has to be considered. We now get to what we call Release Category Number 7, which is the one that the assessment was done. The environmental assessment was done because as Dr. Thompson mentioned, the environmental assessment is done after, with considering the plant design, after all these improvements are in place.

THE CHAIRMAN: Well, let me ask you a hypothetical question. So if the environmental assessment were to go ahead and two years from now there's another public hearing about the actual refurbishment with that kind of study and analysis, what one design, kind of the emergency plan that will go along with the new and improved design of the Darlington will fit into a beyond-

design accident?

I'm trying to figure out what one can do between now and 2014, hypothetically, if the EA goes ahead as is?

MR. TREMBLAY: Pierre Tremblay for the record.

That's already covered by CNSC, expectations around Fukushima follow-up. Those are very explicitly identified and there's already specific expectations as far as timing and so forth.

THE CHAIRMAN: But I thought that even EMO, I thought, expected there was going to be some further work required to develop a full emergency plan. Did I get it right? I mean, they are not here today, but I thought that's what ---

MR. TREMBLAY: Pierre Tremblay for the record.

You know, perhaps we're seeing things a little differently here. I thought you were asking about the specific improvements that would be required.

The only thing I would say around the emergency plan is while the Province has responsibility for developing the plan, we have our own. The improvements that we've made and the changes we've made and the procedures we're written deal with a beyond-design

basis accidents already.

And certainly as the project progresses and we get to looking at the scope of the refurbishment and the ISR, there would be further opportunity to have discussions around those subject matters, absolutely.

THE CHAIRMAN: Okay. I think the other Commissioners -- I've been dominating this discussion.

Monsieur Harvey?

MEMBER HARVEY: Well, I'm a little bit confused, but anyway.

So in fact there is absolutely no possibility that the releases be over what is in your study, over the number of becquerels, which is very low. So this is the top limit in any case, even if some equipment will not perform as they are supposed to perform and if the incident is not exactly what you thought.

In any case, there will never be releases more important than what is in your study?

DR. THOMPSON: Patsy Thompson for the record.

I'll answer the question in terms of the environmental assessment, and then I believe Mr. Frappier can provide answers in terms of the actual modelling use of the information.

So for the purposes of the EA, we looked at

an accident with a probability of one in a million, with a release to the environment. With the safety improvements, the release is filtered and results in a smaller dose to offsite than would have happened without the safety improvements.

Under the environmental assessment follow-up, if the Commission approves the EA, there is a requirement to verify -- confirm that the mitigation, the safety improvements will be implemented and will be in place.

In terms of accidents beyond those that were used in the environmental assessment, the *Canadian Environmental Assessment Act* is a planning tool and there's a requirement of licensing under the *Nuclear Safety and Control Act* to look at the aspects of safety assessments in relation to licensing. And I think my colleagues can speak to that.

MR. WEBSTER: Thank you. It's Phil Webster for the record.

If I could just speak as a nuclear engineer, which Mr. Stensil reminded me yesterday I am, the safety improvement opportunities that OPG has mentioned, these did not magically appear after Fukushima. We actually have correspondence pre-dating Fukushima as part of the preparation for Darlington refurbishment that

listed the safety improvement opportunities they were looking at, and they included the ones that Mr. Elliott has mentioned.

I would also mention that the refurbishment at Point Lepreau that was already underway when Fukushima happened, included two key changes, one being the filter containment vents and the second being the addition of the passive autocatalytic recombiners. So they were already being fitted at Lepreau and they were already expected to be in the scope of the Darlington refurbishment even before Fukushima happened.

MEMBER HARVEY: Will a new build have the same result? I mean, you build new reactors, what will be the difference with the refurbishment?

DR. THOMPSON: Patsy Thompson, for the record.

When the Environmental Assessment for the new build was carried out -- and I believe Dr. Newland is coming up to the microphone -- we used a bounding envelope approach using the safety goals in RDGG3 ---

DR. NEWLAND: Three-seven (37).

DR. THOMPSON: Three-three-seven (337). And Dr. Newland will explain the approach that was taken for the New Build.

DR. NEWLAND: Dave Newland, for the record;

Director New Major Facilities Licensing Division.

The approach taken for new build is consistent with what is being proposed or has been done for Darlington refurbishment, but because a specific technology hadn't been identified and three technologies -- four technologies were being considered, what the proponent considered was taking the safety goals and using those as a surrogate instead of using the detailed PSA work that was used for the Darlington refurbishment.

When you look at the results for the new build environmental impact statement in comparison with those of the EA for the Darlington refurbishment, they're very consistent, and I would also add that the overall process for the EIS for new build was the same -- exactly the same as for the Darlington refurbishment for the EA.

THE CHAIRMAN: Mr. Stensil, you were involved in the new build. Was the same kind of analysis -- were you okay when the analysis was done for the safety case, because it was also post Fukushima, and you accuse the Commission of not learning any lessons. So in the Joint Review Panel on the new build were any of those issues taken into account?

MR. STENSIL: In the review, no. As you know, it started ten days after the Fukushima accident happened. And as well, if you're going to base things on

the probalistic approach, we didn't actually have access to any of the PRAs for the designs because they were hypothetical. So for the advanced CANDU, the EPR, there wasn't -- I believe there wasn't core damage frequencies available for us to actually look at like I am here, I believe. So it was using the same type of bounding approach.

I think what is significant for you is one of the recommendations of the JRP was that in light of Fukushima we should not -- when it comes to radioactive releases, we shouldn't be basing it on this probability theory but looking at the radioactive inventory and what is the hazard that poses to surrounding communities. That was their recommendation on cumulative hazard.

I would like to say as well in regard to all of this, Mr. Harvey, you asked the question about will it not happen in terms of the potential for a radioactive release. Even with all the safety improvements that keep getting talked about, which is a bit of a distraction, according to OPG's risk review, the Darlington Nuclear Station after refurbishment will still have a large release frequency of four to the seven, negative seven. That's just over the line.

I've identified a number of big uncertainties with these PRAs. I think we can see it in

the way this PRA was also developed. And I think in light of Fukushima, I read to you at the May 3rd hearing on “Fukushima: Lessons Learned”, a statement from the Dutch regulator which said:

> "Due to the problems with nuclear plant Fukushima 1 in Japan, all countries in the world having nuclear power plants are going to re-investigate and re-evaluate their calculation of the probability of a nuclear meltdown."

I haven't seen that happen here. But since that May 3rd meeting, in the academic literature you start seeing lots of articles coming out on how do we apply these empirical lessons to PRA methods. There's clearly an uncertainty.

Look at this title, "Fukushima's Lessons: Probability Theory Unsafe." Here is an article actually written by a former staffer from Atomic Energy of Canada:

> "Nuclear and other forms of power will have difficulty gaining…"

Or, no, that's not exact. He specifically says it's difficult to estimate beyond 10,000 or 1,000 reactor years in terms of certainty.

The same thing here around the -- how do we

use the empirical data in these reviews? We haven't done that here. We know there's a significant uncertainty. We know there's large releases just over a cut off line that was made arbitrarily in 1998.

So I think we need to play on the side of caution. We're looking to run this reactor to 2055. And your statutory responsibility is to look at accidents that may occur. There are two accident scenarios in this review that have been identified that haven't been assessed within this environmental assessment. Future hearings aren't important. It's this environmental assessment that's important.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Okay, we've got to move.

Ms. Velshi?

MEMBER VELSHI: I think I'm going to leave that one aside because I'm sure we're going to have a lot more discussion and debate on that before we reach any conclusions on that.

But the second point that you raised was around population growth and that -- and I'm not sure this environmental assessment or the TSDs did not look to growth to 2055 and maybe stopped it, I note you said 2035 or so. Can OPG comment on why that wasn't done -- or if it wasn't done and why not and what the ramifications of

that would be?

MR. TREMBLAY: All right, thanks. I'm going -- it's Pierre Tremblay for the record. I'll ask John Peters to speak to that point.

MR. PETERS: John Peters, for the record.

I need to tell you this story in two parts. In the socioeconomic assessment, we did examine the population growth out to 2055. We –- for the purposes of assessing social and economic issues, it was fair and reasonable, and there was some models that we could use. As we indicated, the database that is actually published by government agencies about population planning predictions only goes to 2031 at this point in time.

Now, when it comes back to assessing accidents and the potential for evacuation and response planning, we’re more constrained, and so when we did the work we looked out to 2026. We looked at today and we looked at 2026 when we had solid numbers and some estimates of the way traffic management and other systems that are relied upon to develop an evacuation plan were –- could be understood in a reasonable manner. We did not attempt to then hypothesize another 25 years down the road what might be the conditions when we had virtually no idea of the extent to which traffic and road improvements would be increased, different, or otherwise.

And in fairness, the reason we abandoned that logic is that we explored it in new nuclear and the Joint Review Panel at the time suggested that it was so hypothetical that it wasn't really very helpful and so they relied more on the earlier two timeframe studies, which we had done. And we've also made the commitment, obviously, as part of a routine licensing process to update that information as population data and new traffic systems or significant changes are made which would alter the numbers.

MR. STENSIL: I find it funny that we were able to do it for Pickering but not for Darlington. That was done, I participated in that review and that's at a much denser site for population.

I would also say, in terms of the way we've dealt with emergency management in this review, I think it was just alluded to. I think a lot of it has been just used from previous reviews from before Fukushima.

When I looked at the technical support document that OPG provided in this review and compared it to the Pickering B review that was prepared around 2007, it looked like they had almost cut and pasted it. Most of the citations dated from Three Mile Island.

And so what we're seeing now, and I've seen some references to this in literature, now we've had three

major reactor accidents worldwide, society is reacting differently to those accidents because they have less trust in authorities. So you cannot simply be using references from Three Mile Island in this current review. And the Darlington new build review as well, all those technical support documents dated from before Fukushima.

So I think that we have lowered the bar in this review. Why we did it for Pickering and not this one, I just -- I find it very difficult to understand, aside from kind of laziness.

MEMBER VELSHI: We've got OPG to answer that as to why it was done for Pickering and not for Darlington.

MR. PETERS: John Peters, for the record. I just want to make it clear in -- in Pickering we went out to the longer timeframe into the future, again, it was totally hypothetical and it was not considered a very credible story.

There’s -- there is really has to be a recognition that you have to work with what’s credible here. We’ve given lots of evidence of the extent of emergency management planning. The work we did in Pickering and Darlington has had a huge influence regionally and provincially on the way that they are looking at the evacuation time studies, and -- and this is

a -- this is a -- a very furtive area of work in my -- there's been an awful lot of good work done here and we're -- we've been really at the leading edge of that.

They -- the Fukushima story will be told in an EA when it's -- when there's a story to tell. It's -- this work was mostly written and done before Fukushima's -- the evidence was out as to what exactly had even happened at Fukushima, and so you have to be realistic about expectations. I think Ontario is not Japan and -- and we need to take the time to do the right work. Pierre has given many illustrations of the extent to which OPG's participated and taken a leading role in that and it's -- it's really premature for us to sit down and say the EA should have been written differently based on some insight from Fukushima at this point in time.

MR. STENSIL: In the scoping of the document, although it did say that lessons from Fukushima would be heated in this review when that was approved in October 2011. So Fukushima's actually -- learning lessons from Fukushima is part of the scope of this. I haven't seen that in regard to emergency planning.

The second question that comes up is: so it's -- it's not credible to make projections about population growth for emergency planning far into the future, but we're doing it with all these other indicators

over the life of the project. Like climate change, for example; you know -- there could be two degrees of warming; there could be six degrees of warming. How can we do it for these other very complex scenarios like you've all heard a lot about Lake Ontario and how it may warm in the different ranges, but why aren't we putting the same level of effort into emergency planning?

I don't understand what's going on.

THE CHAIRMAN: Okay, I will take it under advisement. We hear you. Anybody else want to raise any other question? Are we done? I think you give us a lot to -- to think about. Your final words?

MR. STENSIL: Oh, geeze. This is a new part of this procedure, sorry.

Thank you very much for -- for hearing me tonight. I would -- I would again like to underline for the Commission this is an environmental assessment under CEAA. It's not about future processes related to safety improvements here or there, this is about examining environmental effects that may occur.

OPG's risk assessment has identified a number of accident scenarios that have not been assessed; they need to be assessed. From what -- from my reading of those affects those are irreversible effects, they're adverse effects; that requires an upgrade to a panel.

Finally, I would also encourage the Panel -- and if I can ever help you in this -- it's really unfortunate that you are -- did not have this risk review given to you before this hearing or actually before the scoping hearing. I've taught myself how to read them. This is really where all the details get hidden, and it would be really good if the commissioners could be as well informed as possible about these risks because it's very unfortunate that Greenpeace is the first organization and not your staff or OPG that has brought this up to you.

Thank you very much.

THE CHAIRMAN: Thank you.

MR. JAMMAL: Sorry. I don't think -- it's Ramzi Jammal for the record. I would like to set the record straight with respect to this discussion and -- and I will pass on Dr. Patsy Thompson.

We're forgetting one -- one key element here, is as they integrate safety improvement and the IIP's being put in place the -- the requirement with respect to emergency planning is a licence condition on OPG. And those mitigation measures and those plans will be integral part of the licence before they are authorized to do the refurbishment.

So -- so the -- the EA is measuring the impact and as we go to the ISR and the IIP, that's where

the mitigation measures are going to be implemented, so the fact that staff did not raise it -- staff did raise it and -- and if you go to -- to Mr. Stensil's slide the -- in his slide number showing the -- the scale of the... Sorry, it's not numbered but it's -- it's entitled Considered Actions in a Precautionary Manner, okay? What -- on the -- once we implement, once the IIP's in place you are going into one order of magnitude lower than what's being proposed.

THE CHAIRMAN: Go ahead.

MR. STENSIL: Again, well, there's about three things here.

One -- and this goes to your question, Mr. Harvey, and as well as yours, President Binder, I think you have the right approach in -- in terms of what would happen -- what is the worst case scenario. What we've heard tonight, and no one has denied it, is there are accident scenarios here leading to large radioactive releases that upgrades that have been proposed have been unable to eliminate, and those accidents lie just over an arbitrary threshold; so I'm repeating all this again.

So for your responsibility in terms of environmental effects under CEAA that is your responsibility to look at those effects.

The second piece: around emergency

planning, as you know the Province of Ontario has responsible for -- is responsible for offsite emergency plans, it’s not the Canadian Nuclear Safety Commission. And I would -- I would encourage you to go through the comments in the proposals on both the scope of the EA and the dispositioning of comments from the summer because you’ll start to see some of the differing answers staff have given tonight compared to in the summer.

But in regards to the province’s emergency plans: with the Pickering review, when they looked at an offsite release it helped confirm and assess and improve parts of existing emergency plans. The province also sets this weird cut-off in the past and that may need to be looked at.

In 1988 they ran this public transparent working group that looked at what would be the worst case accidents they would do detailed emergency plans for. As I understand it, at this point in time they were saying 10 to the negative 5. In 1996 they upgraded that to 10 to the negative 7. So it’s different from where the CNSC is at.

They -- those detailed plans are what people are arguing about right now. Are they still sufficient? And CNSC staff aren’t looking at that because it’s not their responsibility but this environmental

assessment would be a proper place to see whether this last step into Fensom depth that we keep hearing about is actually -- have we improved it as much as we looked at for everything for offsite blackout, et cetera, et cetera.

So I think that is an important distinction to make.

THE CHAIRMAN: Thank you. You did get the last word.

Okay, I think -- you -- if you want to talk he is going to have another round with this.

DR. THOMPSON: I -- I know but -- Patsy Thompson, for the record.

My apologies.

Several comments have been made of the nature that an arbitrary cut-off and the cut-off wasn’t arbitrary. The cut-off represents a very serious beyond design basis accident, and the cut-off, one in a million, is based on international best practices, and this is absolutely acceptable for EA purposes.

In terms of the lack of rigor in the acts and consequences assessment that was done compared to climate change I would suggest that the climate change assessment was done using available models, and we have built in follow up programs and adaptive management and the same will be done for accidents and malfunctions. The

expectation is that it’s been identified in the follow up program and the expectation is that under the licensing they will be followed up and there’s an obligation to put in place the mitigation measures, and emergency management is a -- is a requirement of the licensees in coordination with the EMO.

And -- and the licence conditions have always included requirements for follow up and implementation of mitigation measures. And if the project goes ahead the Integrated Safety -- the IIP -- Integrated Improvement Plan will be a licence requirement.

MR. STENSIL: It’s like ---

THE CHAIRMAN: Okay.

MR. STENSIL: --- it’s like tennis.

So, yes, I -- I am willing to call the 10 to the negative 6 an arbitrary number. It has been previously seen as an acceptable cut-off for nuclear regulators internationally, previously. It has never been defined that it is actually an acceptable cut-off number under The *Canadian Environmental Assessment Act* also says to consider projects in a precautionary manner. I’ve identified a number of uncertainties here.

That said, going back to my first point, it has been previously seen as an acceptable cut-off for nuclear operators. What I’m trying to suggest to you

tonight is if we really want to learn lessons from Fukushima, and it’s not simply business as usual, given what Fukushima is showing about the empirical, you know, probability of accidents, maybe we shouldn’t be depending on that anymore, or we should throw that out a few more magnitudes just to be safe.

That’s my point.

THE CHAIRMAN: Okay. Thank you.

The only thing I would say, even though you’re going to rebut that too -- maybe I should shut up -- is we are spending a lot of time in the Fukushima Task Force. This Commission heard a lot of proposed reaction, lessons learned, we take exception with your view that we’re not trying to learn as much as we can, and there may be some new dimension here which is being raised.

We will have to reflect on some of the material we just heard here. But all the ordering of improvement, in fact, in the various NPP in Canada, are because of the Fukushima. And we will continue to march to implement this Fukushima Task Force report. And it’s an ongoing commitment for ongoing improvement.

So, if there’s anything we’re missing here, we will accept good suggestions for improvement. And that maybe one of them we’ll have to reflect on this after I understand what I’ve just said.

So, your last word?

MR. STENSIL: Okay. In terms of the Fukushima Task Force, I think this is good, you know, good eyes is a good idea, you just have to repeat it a lot.

At the May 3rd meeting, I asked the Commission to expand the scope of the Fukushima Task Force, you may recall. You did not consult on the scope of the Fukushima Task Force. It was defined as looking at technical issues to deal with defence and depth.

Since that time, or actually one step later, in the run-up to the start of this process, a number of environmental groups sent you a letter, Mr. Binder, asking, "In light of Fukushima, we're worried about things such as the use of probability and accidents in EAs." You didn't take under consideration at the time. And we see that it's still a controversy right now.

I ask you to expand the scope of the Fukushima Task Force. Yes, you've done a lot of work on defence and depth, but you haven't looked at other contributors that have since been acknowledged as causing Fukushima.

I was at the Durham Nuclear Health Committee meeting about two weeks ago and Mr. Elliott from OPG was there and he actually said OPG has acknowledged, in the past few months, that internationally, we've

accepted international failure as the cause of Fukushima. He started talking about things that OPG was doing to address that. It wasn't part of the Fukushima Task Force, so it's -- we're not consulting on it.

Yesterday, Mr. Jammal said, when asked about what was the probability -- I think it was from you, -- what was the probability of the Fukushima accident? There was a long pause, and then he said, "Well, what happened at Fukushima is issues that should have been design-basis and weren't."

So, what happened -- and I said this to you at the May 3rd meeting -- is regulators and the operators that were working too closely together were simply dismissing risk and didn't build that tsunami wall that could have stopped it, unfortunately.

That is an institutional failure. I've heard it from OPG now, I've heard an acknowledgement from staff, but we haven't opened up the scope of the Fukushima Review. And the scope of the Fukushima Review, for the record, also scoped in this review. So, when I asked for changes to the Screening Report in the summer, for example, there was a line, "The causes of accidents are well understood." Period. And no description of what those causes are.

I said, "Here's all the evidence with

academic reports on institutional failures at cause, we need to acknowledge uncertainty." Just in the text of the screening report that was given to you to make your decision, CNSC staff refused to make that change because it wasn't in the scope of the Review, because it wasn't in the scope of the Fukushima Task Force Review.

So, you see the problem that intervenors are having right now. And I would like to put to you, you're not getting enough information about the risks of this project over the next fifty years. I've identified significant risks. They need to be looked at. And I think that's why it calls for an upgrade to a panel review, Panel Review, I'm sorry to say -- or maybe happy, but -- so, that's my concluding comments, unless you'd like to bang it out.

THE CHAIRMAN: I'm not going to push another round.

Thank you very much.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: There's a moment of truth here about -- well, I was going to go to ---

(SHORT PAUSE/COURTE PAUSE)

THE CHAIRMAN: Okay. We're deliberating about whether you got the stamina to stay until 9 o'clock and we can go through some written submissions.

Those are the written submissions that we've done some before. So, staff?

I think it's a yes. So we want to stay until 9 o'clock and do some written material. Written submission.

UNIDENTIFIED SPEAKER: Okay fine, sure.

THE CHAIRMAN: Okay. So, we'll take a five-minute break, a biological break.

--- Upon recessing at 8:16 p.m./
L'audience est suspendue à 20h26
--- Upon resuming at 8:26 p.m./
L'audience est reprise à 20h26

MR. LEBLANC: Okay. If we may have quiet in the room, please. We would like to proceed with some written submissions.

I'm going to follow the same approach as yesterday, that is I'm going to do the six oral presentations that became written submissions today. So that should be in your -- in one of the books where you had some orals for December 5th.

I'm going to try to go through a bit of an order of where they were supposed to appear. And then we're going go to the written submissions that are planned

as being written submissions.

So, it starts with H13.85. And this is a written submission by Bhavnita Shah.

12-H13.85

Written submission by

Bhavnita Shah

MR. LEBLANC: So, I'll just make sure everybody has a chance to get organized.

THE CHAIRMAN: Eight-five (85)?

MR. LEBLANC: Eight-five (85). That was the fourth submission today.

MR. LEBLANC: Okay. Any questions from the Members?

Dr. McDill, please.

MEMBER McDILL: Thank you.

This intervention, again, raises the issue of the *Federal Fisheries Act* and DFO. I think it's important just to mention or hope that the intervenor reads back to some of the transcripts on DFO.

There we are.

Is it possible to quantify in terms of something like a regular hydro intake, some sort of comparison of the fish loss? Not a nuclear intake.

THE CHAIRMAN: We don't hear you very well.

MEMBER McDILL: I'm sorry. I'll move this forward.

Does DFO have any kind of comparison between fish losses, say, in a hydroelectric facility versus this one? Or coal-fired or ---

MR. HOGGARTH: Yeah, Tom Hoggarth, for the record.

That specific answer, no, we don't. We haven't put together sort of an analysis of, you know, intakes in the Great Lakes with potential intakes on rivers.

We do -- when we're getting involved in all these projects, we look at site specific because quite often the entrainment numbers, impingement numbers are very site specific as opposed to type of project specific.

So in the hydro industry, it really depends on the river, the fish populations, the requirement to fish to move back and forth on whether you're going to have impingement entrainment numbers.

So it would be really hard to sort of get sort of like an industry number, in a sense.

THE CHAIRMAN: Just as an aside, I -- once Pickering put their net into -- the fish net in, somebody submitting an article -- it's from a U.S. based

organization that -- extolling -- that complimented Pickering and beat up on all the American and all the others for not doing something similar.

So -- and if memory serves, I think they said that -- they actually criticized some of the other practices of some of the other stations in the States for not doing a similar thing, which means to me that somebody knows what the impingements are on the other power.

MR. HOGGARTH: Yeah. I wouldn't say nobody knows. I do agree that when we've looked at intakes, there are -- again, there are intakes down in the States that also have increased numbers or large numbers of fish impingement entrainment.

But when -- for Fisheries and Oceans, our reviews are always on a site specific review and looking at a particular intake, a particular project and then assessing the impingement entrainment on them.

We very rarely would ever get into a comparison, yeah, but this site has this, how come you don't do that. We look at it as a site specific basis.

THE CHAIRMAN: Okay. Thank you.

MR. HOGGARTH: Thank you.

MEMBER McDILL: I wasn't sure if I was getting a nod from -- does staff want to comment?

DR. THOMPSON: Patsy Thompson, for the

record.

It would be being a bit facetious. I was going to remind Mr. Binder that it's actually Lake Ontario Waterkeeper who congratulate the CNSC for a job well done.

THE CHAIRMAN: Are you sure: I would have remembered that.

DR. THOMPSON: I would say I'm 98 percent sure.

THE CHAIRMAN: Oh, I thought it was an American publication. Maybe we can dig it up and can compare notes here.

Okay, thank you.

MR. LEBLANC: The next oral that became a written is H13.87 from Mr. Mark Reid.

12-H12.87

Written submission from

Mark Reid

MR. LEBLANC: Any questions?

THE CHAIRMAN: That was discussed.

MR. LEBLANC: So this was discussed. So the next one is from Jennifer Deguire, H13.102.

12-H13.102

Written submission from

Jennifer Deguire

MR. LEBLANC: No questions.

So the next oral that became a written is H13.105, and that's from the Ontario Clean Air Alliance.

12-H13.105

Written submission from

Ontario Clean Air Alliance

MR. LEBLANC: No questions.

So the next oral that became a written is H13.160 from Ira Rabinovitch.

Is it 169? One fifty-nine (159); sorry.

12-H13.159

Written submission from

Ira Rabinovitch

MR. LEBLANC: No.

So the last oral that became a written is H13.176, which is the National Farmers Union Wellington Waterloo Local.

12-H13.176

Written submission from

National Farmers Union

Waterloo Wellington Local

THE CHAIRMAN: Yeah. My question is on -- we should have a regulation that we will not accept any submission that doesn't have page numbers. Right?

DR. THOMPSON: We've learned that very well.

THE CHAIRMAN: Yeah. I think Marc should insist on that.

So on the second page, number 5, I keep seeing this often. Is that true, lack of regulation on safe level of radiation dose in different food?

I remember seeing all kind of -- in fact, they may not be the same level across countries, but I know in Japan in the -- our own CFIA, et cetera, and Health Canada have whole tables of these.

DR. THOMPSON: Patsy Thompson, for the record.

That's correct, sir. There are regulations in place that set levels of radionuclides that are acceptable in food which represent very low levels. There are also -- for example, Health Canada has guidelines on

restriction of radioactivity in food and water, and they've also set levels for -- during an emergency, for example.

And as you pointed out, for items coming out of Japan, they did measurements and controlled import and export -- or export.

One of the things that is being discussed, the European Commission level and at the IAEA level is bring consistency across nations in terms of values to facilitate movement of material across borders.

THE CHAIRMAN: But until this is done, I would hope that if the project is going ahead in 2014 in the emergency plan if you have to do evacuation there will have to be a real comprehensive, as comprehensive as we can do, list of thou shall not eat apple beyond that, not drink milk beyond that, not drink water beyond that because there was -- I remember in Fukushima there was chaos about what you can consume and what you cannot consume.

DR. THOMPSON: Patsy Thompson, for the record.

We have met with Health Canada and they're in the process of updating their guidelines for emergencies. And through the United Nations organizations, the food and agricultural organization is

also updating their alimentary codex to modernize those standards as well.

So there's a lot of work being done, and I think if Mr. Sivoin is there, there's information on the provincial nuclear emergency plan with guidelines as well.

THE CHAIRMAN: That could be ready for 2014 if the project goes ahead?

DR. THOMPSON: Patsy Thompson, for the record.

As you know, one of the actions on staff is for us to have that information in place.

We've met with Health Canada and we're working together to timelines that would meet 2014, we believe.

THE CHAIRMAN: That's it? Okay. Thank you.

Anybody else? Dr. McDill?

MEMBER McDILL: I'm sorry the intervenor didn't actually come, because I would have liked to have asked some questions, but this is, I think, the first farmer's submission I've seen. So it is an interesting submission.

One point I will ask for clarification on is Item 2. It's about four pages in. I think it's the top of the fourth page. There are no places identified

along Lake Ontario where we could have fish, birds and other foods produced in and around the lake tested for contamination.

I think we've talked about this a little bit, but this particular intervenor is saying along Lake Ontario. So perhaps I could ask staff and OPG just to summarize where these are being sampled or anticipated to be sampled in the future?

We could start with OPG.

MS. SWAMI: Laurie Swami.

I have a black and white copy of a map and I'm struggling -- of the map of the locations for sampling. So it's somewhat difficult for me to be precise in my answer.

What I can say, though, is that the information of where we take samples is available on our website. The report -- the radiological environmental monitoring report also lists all of the types of samples that we take and what they're actually analyzed for.

And so the intervenor could certainly get that information, but I can confirm there is sampling along Lake Ontario.

MEMBER McDILL: For fish, birds?

MS. SWAMI: So in Lake Ontario we would clearly sample for fish. Birds, we wouldn't necessarily

sample birds, but we sample many other vegetation feed, that type of thing. So we use that to analyze what the impact would be on a public dose.

We, through an ecological risk assessment, have also assessed where the risks would be from a biophysical environment, and that process is in place as well.

MEMBER McDILL: I'm just wondering if this particular intervenor, because he mentions hunting in -- he or she ---

MS. SWAMI: They.

MEMBER McDILL: The Union mention hunting wild boar in Germany, I think it was, if this is a reference to bird hunting in Ontario? This is why I was hoping the intervenor would -- or a representative would actually show up. And hunting is allowed in Ontario in certain seasons of the year.

DR. THOMPSON: Patsy Thompson, for the record.

The intervenor isn't here, so it's a bit difficult, but the reference to the draft screening report, I understand that for both normal operations and accidents and malfunctions, we did look at doses to fish and wildlife as a result of releases, and in both cases the risks are low.

As OPG mentioned, there is monitoring under their radiological environmental monitoring program, and ---

MEMBER McDILL: So are any waterfowl tested?

MS. SWAMI: Laurie Swami for the record.

I'm looking at our Table 4-1 in the radiological environmental monitoring program, and we list the samples that are taken and the fish is essentially the wildlife that we would sample. The others are done through modelling and the like.

THE CHAIRMAN: Thank you.

Dr. Barriault?

MEMBER BARRIAULT: For CNSC, is CFIA involved at all in monitoring of food products from a radiation point of view and also animal feed? Are we involved with that or is CFIA doing that?

DR. THOMPSON: Patsy Thompson for the record.

My answer would be yes, but I think Mr. Sigouin is back there and will be able to speak to that.

MR. SIGOUIN: Luc Sigouin for the record.

So in the case of an accident with a release, the provincial nuclear emergency plan calls for standing up an assurance monitoring group which is

comprised both of provincial ministries and federal departments, and specifically at the federal level, it includes CFIA and Health Canada.

MEMBER BARRIAULT: On the issue of importing food products from Japan, for example, at this point, is that ourselves or is CFIA doing this?

MR. SIGOUIN: So if I understand the question, is monitoring of food coming into Canada ---

MEMBER BARRIAULT: At this point, from Japan?

MR. SIGOUIN: --- from Japan at this point?

MEMBER BARRIAULT: Long term, is it CFIA that's going to do this or is it us? Because what I'm hearing is that we just do it in case of an emergency. Is that correct?

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

It's post-Fukushima and CBSA has the monitoring, and we had a lot of monitoring of containers to include food. A lot of times we get called in to CBSA alerting triggers, triggering an alarm, and it turns out to be other -- bananas will trigger the alarms, boxes of bananas. But the monitoring for the shipments does take place and sometimes it's simple washing on the outside of the container, but CFIA has a role from that perspective.

But the first ---

MEMBER BARRIAULT: Directly monitoring.

MR. JAMMAL: The first monitoring is through CBSA.

MEMBER BARRIAULT: Okay. Thank you.

MR. JAMMAL: As it enters Canada.

MEMBER BARRIAULT: Thank you, Mr. Chairman.

MR. LEBLANC: We will now proceed to the written submissions binder. The first one we're going to look at is H13.56, which is a written submission from Renée Cotton.

12-H13.56

Written submission from

Renée Cotton

MR. LEBLANC: Any questions?

Madame Velshi?

MEMBER VELSHI: Kind of similar to the last one where she talks -- well, not similar. She talks about evacuation and whether livestock impacts are part of the plan. Are they? Page 1, third last paragraph.

THE CHAIRMAN: Staff, are you having problems with this?

MR. SIGOUIN: Luc Sigouin for the record.

The provincial nuclear emergency plans don’t specifically lay out requirements or address the issue of pets.

We know it’s -- we’ve observed during drills and exercises that it has been identified, and we believe that EMO will consider this in the updates to their plan.

With respect to livestock, no, there’s no -- there are no provisions for evacuation of livestock, but monitoring of livestock after an event is part of the assurance monitoring activities that I referred to earlier.

THE CHAIRMAN: One thing we haven’t talked about, and I just think that we need to at least -- on the second page of this intervention, it talks about a public alerting system should be in place for the entire zone and KI pills should be supplied in advance.

Can you comment on that? I was under the impression that it is available and done.

MR. SIGOUIN: Luc Sigouin for the record.

So I guess your question, Mr. President, is regarding KI pills being pre-distributed?

THE CHAIRMAN: The intervenor is talking about a public alerting system. Is that done now throughout the zone?

MR. SIGOUIN: So the public alerting system in the three kilometre zone around Darlington is completed. The public alerting system in the three kilometre zone around Pickering is underway and when we last heard from Durham Region, they indicated it's likely to be completed by the end of this year.

In regards to the entire zone which might reference the primary zone, which is the ten kilometre zone, EMO has indicated to us that they are working with Durham on developing a plan for addressing that but in the interim, there is a telephone dialling system that is functional.

THE CHAIRMAN: Okay.

MR. LEBLANC: The next submission is H13-68 and it's a written submission from Andrei Neacsu. Any questions?

12-H13.68
Written submission from
Andrei Neacsu

THE CHAIRMAN: No.

MR. LEBLANC: The next one is H13-69, a written submission from Jen Mooney.

12-H13.69

Written submission from

Jen Mooney

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is 13.70, a written submission from Mary McGillis.

12-H13.70

Written submission from

Mary McGillis

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is 13.71 from Rabeya Alam.

12-H13.71

Written submission from

Rabeya Alam

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is H13.72, a written submission from Paul Courey.

12-H13.72

Written submission from

Paul Courey

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is 13.73, a written submission from Karen Kwok.

12-H13.73

Written submission form

Karen Kwok

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is 13.74, a written submission from Erika Tran.

12-H13.74

Written submission from

Erika Tran

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is 12-H13.75, a submission from the Port Hope and District Chamber of Commerce.

12-H13.75

Written submission from

The Port Hope and District

Chamber of Commerce

THE CHAIRMAN: No.

MR. LEBLANC: The *ne*xt submission is H13-76 from Don Chisholm.

12-H13.76

Written submission from

Don Chisholm

THE CHAIRMAN: Just a question. Somebody remind me, you mentioned, this intervenor mentioned energy return on investment. We don't really track or deal with any of those things. Okay, I just wanted to make sure.

MR. LEBLANC: The direct response was no.

So the next submission is H13.77 from the Community Living Oshawa-Clarington.

The next submission is H13-78 from Norm and Donna Boychuk.

12-H13.77

Written submission from the

Community Living Oshawa-Clarington

12-H13.78

Written submission from

Norm and Donna Boychuk

THE CHAIRMAN: No.

MR. LEBLANC: The next submission, H13-90 is from Durham College.

12-H13.90

Written submission from

Durham College

The next submission, 13-91 is from Jenny Carter.

THE CHAIRMAN: And I think that -– I hate to open up, but there’s a statement here that I think needs a kind of a yes-no answer. The first page, last paragraph, “mining, it kills miners usually by a slow and painful death from cancer”. True?

DR. THOMPSON: Patsy Thompson, for the record.

The studies that have done on uranium miners show that the early miners in the 30s and 40s had increased rates of lung cancer. In Canada our studies have shown that with reduced, better ventilation and control of radon decay products from about the mid-70s,

that the risk has decreased and workers are as healthy as the general population.

THE CHAIRMAN: Thank you.

MR. LEBLANC: The next submission is H13-92 from Braven Corby.

12-H13.92
Written submission from
Braven Corby

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is H13-93 from Michelle Bode-Simeunovich.

12-H13.93
Written submission from
Michelle Bode-Simeunovich

THE CHAIRMAN: Go ahead, please.

MEMBER VELSHI: On page one, second last paragraph, question for staff. Globally, there have been approximately 24 nuclear power accidents with multiple fatalities. Can you comment on that statement, please?

DR. THOMPSON: Ms. Velshi, we have data in terms of fatalities associated with Chernobyl. If we

could come back tomorrow morning and give you the number but it's in the hundreds, not the numbers that they're speaking here.

MEMBER VELSHI: Yes, though the question is have there been 24 nuclear power accidents?

MR. JAMMAL: Ramzi Jammal, for the record.

Not to our knowledge. We are not aware of 24 nuclear power plant accidents.

THE CHAIRMAN: Even in Fukushima, is there any fatality from the radiation accident in Fukushima?

MR. JAMMAL: Ramzi Jammal, for the record.

From Fukushima incident there has been to date no fatalities associated with radiation.

THE CHAIRMAN: Okay, thank you.

MR. LEBLANC: The next submission is H13-94 from Robin Penney.

12-H13.94

Written submission from

Robin Penney

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is H13-95 from Peter Tabuns, MPP, Toronto-Danforth.

12-H13.95

Written submission from

Peter Tabuns, MPP,

Toronto-Danforth

THE CHAIRMAN: No.

MR. LEBLANC: The next submission is H13-96 from the Rotary Club of Courtice.

The previous one.

12-H13.96

Written submission from the

Rotary Club of Courtice

THE CHAIRMAN: Mr. Harvey.

MEMBER HARVEY: Okay, second paragraph from the bottom. The plan has not gone before the Ontario Energy Board and has therefore not been approved or formally adopted as Ontario's electricity system plan.

Because -- which include the refurbishment of Darlington. Could you just comment on that paragraph, Mr. Tremblay?

MR. REINER: Dietmar Reiner, for the record.

I can't comment whether there's an

obligation for that to go in front of the Energy Board. I believe that is the intent but that's a provincial decision and it would be the Ontario Power Authority that would take plan forward. They're currently operating under a directive that they received from the Ministry of Energy that identifies specific requirements that need to be incorporated into that plan, and one of those requirements does include the refurbishment of Darlington.

THE CHAIRMAN: But you don't need approval from OEB for the refurbishment?

MR. REINER: No, we do not. Dietmar Reiner, for the record.

We do not need approval from the OEB for the refurbishment, however, we are a rate-regulated utility and we recover our costs through the OEB process and so any investment that we would make in the refurbishment project, a vehicle that we need to be cognizant of is the OEB rate-recovery regime. But we do not need OEB approval.

So the approval would come from -- the approval comes via a directive from the Minister of Energy to OPG to assess the feasibility of refurbishing the nuclear units. That led to the assessments we bid internally and a decision by our board to proceed with Darlington and not to refurbish Pickering, and that was

approved by the Minister of Energy.

THE CHAIRMAN: Since we are doing probability assessment, I can see a scenario, a 10 the minus 6 scenario where we approve refurbishment and OEB give you zero rate.

MR. REINER: Dietmar Reiner, for the record.

That is a risk that we are aware of and it is something that we are actually dealing with internally. The whole question of cost recovery associated with the refurbishment.

THE CHAIRMAN: Thank you.

MR. LEBLANC: The next submission is H13.97 from Rick Maltese.

12-H13.97

Written submission from

Rick Maltese

MR. LEBLANC: The next submission is H13.98 from Don Weitz.

12-H13.98

Written submission from

Don Weitz

MR. LEBLANC: The next submission H13.99 from Marc Green.

12-H13.99

Written submission from

Marc Green

MR. LEBLANC: The next submission is H13.100 from St. Marys Cement (Canada).

12-H13.100

Written submission from

St. Marys Cement Inc. (Canada)

MR. LEBLANC: The next submission is H13.111 from Hamish Wilson.

12-H13.111

Written submission from

Hamish Wilson

MR. LEBLANC: The next submission is H13.112 from Paul Gasztold.

12-H13.112

Written submission from

Paul Gasztold

MR. LEBLANC: The next submission is H13.113 from Jurgen Schmutz.

12-H13.113

Written submission from

Jurgen Schmutz

MR. LEBLANC: The next submission is H13.114 from Harold Fassnacht.

12-H13.114

Written submission from

Harold Fassnacht

MR. LEBLANC: The next submission H13.115 from Kelly Carmichael.

12-H13.115

Written submission from

Kelly Carmichael

MR. LEBLANC: The next submission H13.116 from Alison Petten.

12-H13.115

Written submission from

Alison Petten

MEMBER VELSHI: I have a quick question on that. Sorry, a question for staff on 116. Her first sentence she says:

> "I have had the unfortunate opportunity to work with people who have been harmed by nuclear energy." (As read)

Have there been any Workers' Compensation claims that have succeeded with people who have claimed radiation exposure resulting in cancer or any other illness?

MR. JAMMAL: Ramzi Jammal, for the record.

The quick answer is no, there has been some incidents with workers getting exposure and we, under our requirements, will ask them to go seek medical help but no one has came back with any positive reaction, from work perspective. Now, I'm not sure if this person worked outside Canada or not.

THE CHAIRMAN: Again, just to be absolutely clear; I don't know if nuclear energy includes some medical issues. We know about people were over and under dose, if you know what I'm saying?

MR. JAMMAL: Yes. This is not for the medical practice. This is for workers who have, for example, removed -- it's Ramzi Jammal, for the record, by the way.

So it's, for example, we had incidents where geography workers would pick up source in their hand and they have an extreme level of dose and those -- the medical follow-up has shown that they had no long-term ---

THE CHAIRMAN: Yeah, but nuclear energy could include some medical practices.

MR. JAMMAL: Okay.

THE CHAIRMAN: Anyhow, I ---

MR. JAMMAL: Well, let me ---

THE CHAIRMAN: --- just want to make sure ---

MR. JAMMAL: --- confirm that in Canada we have not had any overdose incidents for two decades for now.

MEMBER BARRIAULT: My understanding is that you'd have to have a lost-time injury for compensation to be involved. If it's just an exposure, I don't think

you’d have any. That’s right, okay.

MR. LEBLANC: The next submission is H13.117 from Robert Hunter.

12-H13.117

Written submission from

Robert Hunter

MR. LEBLANC: The next submission is H13.118 from Glen and Margaret Woolner.

12-H13.118

Written submission from

Glen and Margaret Woolner

MR. LEBLANC: The next submission is H13.119 from Debra Reed.

12-H13.119

Written submission from

Debra Reed

MR. LEBLANC: The next submission is H13.120 from the Canadian Unitarians for Social Justice.

12-H13.120

Written submission from

Canadian Unitarians for

Social Justice (CUSJ)

MEMBER TOLGYESI: Yes, on page 3 before last paragraph and it's second line, it's:

> "Corrosion problems have caused major shutdowns of the plants more often than expected, often for many months." (As read)

Could you comment?

MR. TREMBLAY: Pierre Tremblay, for the record.

Sorry, I'm just trying to find the reference here. This is the -- page 3.

MEMBER TOLGYESI: Page 3 before last paragraph, second line, at the end it starts, "Corrosion problems..." Second bullet from bottom, yes.

MR. TREMBLAY: Oh, I see. All right. Yeah, Pierre Tremblay.

THE CHAIRMAN: While we're waiting, Mr. Tolgyesi, note that this was March 31st, 2011; this was done for the Joint Review Panel.

MEMBER TOLGYESI: Oh.

THE CHAIRMAN: Nevertheless ---

MEMBER TOLGYESI: I was never, you know, looking at the date. I was reading the ---

THE CHAIRMAN: No, I know. I just noticed it, so you may want -- still, a legitimate question.

MR. TREMBLAY: Yeah. Yeah, fair enough. I guess in terms of -- really, I guess this refers to -- this doesn't refer necessarily to Darlington. It talks about Ontario power plants, I guess that's what I'm reading. But, anyways, maybe Mark can talk about the condition monitoring that we do.

MR. ELLIOTT: It's Mark Elliott, for the record.

We have -- the only thing that comes to mind with this one is that -- not at Darlington which we've talked about, our steam generators at Darlington being kept in good shape. But over the years at Pickering and at Bruce we've had issues with the steam generators that have caused forced outages. We've overcome those. We've done complete inspections and maintenance activities and the steam generators are operating well now. But late nineties, like '99, 2000, there was a number of outages at Pickering that I recall.

THE CHAIRMAN: Thank you.

MR. LEBLANC: The next submission is from

Genevieve Delmas Patterson, H13.121.

12-H13.121
Written submission from
Genevieve Delmas Patterson

MR. LEBLANC: The next submission is H13.122 from the Environmental Coalition of Prince Edward Island.

12-H13.122
Written submission from
Environmental Coalition of
Prince Edward Island (ECOPEI)

MR. LEBLANC: The next submission is H13.123 from the Greater Oshawa Chamber of Commerce.

12-H13.123
Written submission from
the Greater Oshawa
Chamber of Commerce

MR. LEBLANC: The next submission is H13.124 from Blake Reid.

12-H13.124

Written submission from

Blake Reid

MR. LEBLANC: The next submission is H13.125 from Eva Torn Thomas.

12-H13.125

Written submission from

Eva Torn Thomas

MEMBER TOLGYESI: Here on page 2 before last paragraph, one, two, three, four, five, six lines from the bottom:

> "The current drinking water guidelines of 7,000 bequerels allow 350 excess fatal cancers per million people." (As read)

DR. THOMPSON: Patsy Thompson, for the record.

As we discussed earlier, 7,000 bequerels per litre is based on a dose of 0.1 millisievert, so using the linear no threshold relationship you get that cancer incidence rate. But

we've also said that because of the strict controls in place on the operations of Darlington that the actual drinking water quality is about 5 to 7 bequerels per litre and that would represent a cancer risk of less than one in a million.

MEMBER McDILL: In the same intervention on the last page, I guess technically the third-last paragraph:

> "I recommend that Canada talks to Finland for they are the only country in the process of actually implementing a plan." (As read)

I believe both staff, and perhaps (inaudible) but I believe staff for certain has actually talked to the Finnish regulators and is sharing best practices.

MR. HOWARD: Don Howard, for the record.

We have spoken to the Swedish regulator on their plans and how they're progressing with their implementation of a disposal repository. We are planning on also meeting with the Finnish regulator to get some insight on their process and how the regulatory bodies are, basically, assessing applications for repositories which will help us when we receive the application.

MEMBER McDILL: The Finnish regulator and

the Swedish regulator are using the same plan, although I guess there’s a different orientation, vertical versus horizontal in the copper canisters. I think. Is that correct?

MR. HOWARD: Don Howard, for the record.

Basically, the regulatory structure is slightly different in each country, obviously. But the methodology that is used would be similar and this is where we’re trying to get their experience on the methodology that is being used in assessing an application for a repository and which we will bring back to Canada.

MEMBER McDILL: Does OPG want to add?

MR. TREMBLAY: Yeah. Pierre Tremblay, for the record.

No, just to add that we’ve done extensive benchmarking, and that's included Finland.

MR. LEBLANC: The next submission is H13.126 from Sheila-Marie Richardson.

12-H13.126
Written submission from
Sheila-Marie Richardson

MR. LEBLANC: Le prochain mémoire est 12-H13.127 de Louisette Lanteigne.

12-H13.127

Mémoire de

Louisette Lanteigne

MR. LEBLANC: The next submission is H13.128 from Dick O'Connor.

12-H13.128

Written submission from

Dick O'Connor

THE CHAIRMAN: I know that NRCan probably is not listening, but the previous intervenor, this is the 127, Louisette Lanteigne, she has a slide -- oh, drives me nuts, there's still no page number. But if you go somewhere in the middle, you'll see some chart. And they're talking about this geological fault line. Do you know which one it is? I mean, she gave all kind of geological data.

What I want to know is we didn't really get into whether they, or you know, whether there is fault line under Lake Ontario in Darlington. Can somebody say to me yes or no? There's some concern on that one or not?

MR. LEBLANC: And you are correct, NRCan is

no longer on line.

MR. JAMMAL: For the record, Ramzi Jammal. Can we ---

THE CHAIRMAN: Go ahead.

MR. JAMMAL: So this faults, years ago, so it was discussed this and it was established that, in fact, the slide don't represents faults, they're remnants of the glacial era. And NRCan provided a pretty documented answer to this.

THE CHAIRMAN: Is it of concern with this ---

MR. JAMMAL: No, there is no concern. There is no fault.

THE CHAIRMAN: Thank you.

MR. LEBLANC: The next submission is H13.129 from Azreen Sikder.

12-H13.129

Written submission from

Azreen F. Sikder

MR. LEBLANC: The next submission -- oh, sorry.

MEMBER McDILL: It's hard to keep up sometimes. Second page at the bottom.

MEMBER HARVEY: Which one?

MEMBER McDILL: This is 129. There is a comment from this intervenor that the fish are swimming through the thermal plume and experiencing thermal shock and dying. Perhaps we could have a comment on -- clarification on that?

MEMBER HARVEY: Where is that?

MEMBER McDILL: It's the very last paragraph on the page. Deuxième page, it's page 2.

MR. TREMBLAY: Pierre Tremblay, for the record.

We'll get John Peters to put that one to bed.

MR. PETERS: This refers to our thermal discharge related to the normal operation of the plant. The discharge is designed to prevent such things from occurring and the -- there is no evidence at all that we've had any evidence of that kind of effect. Because the design is high energy and mixing, the temperature never reaches a thermal shock condition, as is being suggested.

MEMBER McDILL: Thank you.

MR. WISMER: Don Wismer, here.

I can add to that. I've been working in -- my thesis was on this topic and it started at Bruce A in

1977. And I've been working around Great Lakes power plants for 30 years. I saw thermal shock incidents once and it was natural. The lake turned over in response to a storm and some channel cats that were residing in the thermal discharge, a few hundred died. It was a combination of the lake suddenly changing 10 degrees C, and then they were used to warmer temperatures in the discharge, so they went through a total change in the space of a day of about 15 degrees C.

But it's very unusual and especially for multi-unit stations because if they shut down one unit for an outage, there is still others there to buffer the temperature change.

MEMBER McDILL: So in that case, it was a preference of the fish for the warm water ---

MR. WISMER: Yes.

MEMBER McDILL: --- of the out -- yeah.

MR. LEBLANC: The next submission is H13.130 from Vijanthan Thiruchelvarajah.

12-H13.130

Written submission from

Vijanthan Thiruchelvarajah

MR. LEBLANC: The next submission is 13.131

from Dominique Bruce.

12-H13.131

Written submission from

Dominique Bruce

MEMBER VELSHI: Question for OPG. It's on the second last paragraph, the intervenor, and this is -- and I ask this because another intervenor, H13.125, had the same numbers of the number of eggs and larvae that had been killed. And there's such precision there of 15,631,833 eggs, et cetera. So how do these get counted? And it says more than one intervenor has those precise numbers.

MR. PETERS: John Peters, for the record.

When we count eggs and larvae, there is a specific methodology that is developed. We have a screen that is a very fine mesh and a fixed volume of water is run through that screen, either in the fore bay or in the lake, depending on where the sampling is being done. And we count in great detail everything that is caught on that fine mesh screen. So it's fine enough to capture eggs and larvae.

And then, using a mathematical model, we will derive the total number of eggs assuming the rest of

the plant operating for a fixed period of time drew the same volumes of water with the same ratio of eggs and larvae. So it is a mathematical derived model that we agree on in a principle before we do the sampling and then calculate the numbers. So it isn't that we counted 15 million eggs. In fact, very often we've counted one egg and three larvae. That's more typical of what we get and these are the numbers that are derived from that.

THE CHAIRMAN: So they make you ---

MR. PETERS: And that's one of the fundamental reasons why we have a great deal of trouble with entrainment sampling because the whole industry accepts and acknowledges that it's extremely difficult to statistically get the same answer twice. It's just -- because of these very imprecise methods.

THE CHAIRMAN: But, let me give you gratuitous advice, I would round it off because some of us, when we see numbers like this, unless you give me plus or minus, I don't believe it. So I would not come with sort of that precision.

MR. PETERS: John Peters, for the record.

Dr. Binder, I accept your point completely. I have worked tirelessly through my career to get the scientists that work in EA to generalize and give us more helpful numbers, and it's very difficult.

THE CHAIRMAN: I know, actually.

MR. PETERS: Thank you.

THE CHAIRMAN: Thank you.

MR. LEBLANC: The next submission is H13.132 from Robert Kiley.

12-H13.132

Written submission from

Robert Kiley

MR. LEBLANC: The next submission is 13.133 from Trixie Deveau.

12-H13.133

Written submission from

Trixie Deveau

MR LEBLANC: The next submission is 13.134 from Anita Nickerson.

12-H13.134

Written submission from

Anita Nickerson

MR. LEBLANC: The next submission is 13.135

from Meghan Robinson.

12-H13.135

Written submission from

Meghan Robinson

MR. LEBLANC: The next submission is 13.139 from Borden Rhodes.

12-H13.139

Written submission from

Borden Rhodes

MR. LEBLANC: The next submission is 13.141 from Clemente Ciamarra.

12-H13.141

Written submission from

Clemente Ciamarra

MR. LEBLANC: The next submission is 13.142 from Eleanor Grant.

12-H13.142

Written submission from

Eleanor Grant

MR. LEBLANC: The next submission is 13.143 from Agi Lukacs.

12-H13.143
Written submission from
Agi Lukacs

MR. LEBLANC: The next submission is 13.144 from Scott Pharand and family.

12-H13.144
Written submission from
Scott Pharand and Family

MR. LEBLANC: The next submission is 13.145 from Laura Neilans.

12-H13.145
Written submission from
Laura Neilans

MR. LEBLANC: The next submission is H13.147 -- oh, sorry.

MEMBER McDILL: Sorry. This intervenor comments on the emergency planning zone excluding her neighbourhood and outside of the area protected by the public alerting systems, KI pill distribution and evacuation planning.

Could I ask staff to comment briefly on that please, the second paragraph, “I live in”. I mean OPG.

MS. SWAMI: Laurie Swami.

The zone that she’s talking about is the 10-kilometre zone around our Darlington facility. And so that is where the majority of the planning takes place.

However, as we’ve heard from Emergency Management Ontario, there is planning that goes beyond the 10-kilometre zones and it is part of the secondary zone from an emergency planning perspective.

MEMBER MCDILL: Thank you.

I just wanted to reassure the intervenor that the first clue wouldn’t be people driving through her neighbourhood on their way out to 20 kilometres.

THE CHAIRMAN: Again, I meant to ask this a long time. Even here, I’m talking about the precision. Is it really precise? Somebody measured 10 -- you know, three kilometres and if they run into a house, and half a house is in, half a house is not.

Can somebody opt in to some of those things? What's the flex here?

MS. SWAMI: Laurie Swami for the record.

Jim Coles is with us tonight, and he's probably in a better position to describe the flexibility around those numbers.

However, what I would say is that the -- there is a planning zone that's based on road networks, rather than on a circle and goes through someone's house.

The other thing I would mention is in our evacuation time estimate study, while we did a study that went out to the 10 kilometre zone, we also considered that there would be a shadow evacuation, if you will, that would go beyond the 10 kilometre zone, and that gets factored into some of the planning that takes place.

THE CHAIRMAN: Okay. Thank you.

MR. LEBLANC: Next submission is H13.146 from Diane Varga.

12-H13.146

Written submission from

Diane Varga

MR. LEBLANC: The next submission is H13.147 from Peter Stubbins.

12-H13.147

Written submission from

Peter Stubbins

MR. LEBLANC: The next submission is H13.148 from Naomi Matoba.

12-H13.148

Written submission from

Naomi Matoba

MR. LEBLANC: The next submission is H13.149 from Kyle Murtrie.

12-H13.149

Written submission from

Kyle Murtrie

MR. LEBLANC: The next submission is H13.150 from Science for Peace.

12-H13.150

Written submission from

Science for Peace

MR. LEBLANC: The next submission is H13.157 from Eleanor Olmsted.

12-H13.157

Written submission from

Eleanor Olmsted

MR. LEBLANC: The next submission is H13.161 from Sawomi Chowdhury.

12-H13.161

Written submission from

Sawomi Chowdhury

MR. LEBLANC: The next submission is H13.162 from Abe Chan.

12-H13.162

Written submission from

Abe Chan

MR. LEBLANC: The next submission is H13.163 from the Pembina Institute.

12-H13.163

Written submission from

the Pembina Institute

THE CHAIRMAN: I was surprised -- this is a comment. I was surprised they didn't show up, because they normally are intervenors in such proceedings.

MR. LEBLANC: The next submission is H13.164 from Sharolyn Vettese.

12-H13.164

Written submission from

Sharolyn Vettese

MR. LEBLANC: The next submission is H13.165 from Debra Slater and Barbara Hunter.

12-H13.165

Written submission from

Debra Slater and Barbara Hunter

MR. LEBLANC: The next submission is H13.166 from Cameco Corporation.

12-H13.166

Written submission from

Cameco Corporation

MR. LEBLANC: The next submission is H13.167 from Mark Hathaway.

12-H13.167

Written submission from

Mark Hathaway

THE CHAIRMAN: I want to be on the record saying I enjoy reading this deck. It’s a nice deck.

MR. LEBLANC: Even though it’s not numbered -- pages are not numbered, yes.

THE CHAIRMAN: Nothing is perfect.

MR. LEBLANC: The next submission, H13.168 is from Julien Dupont.

12-H13.168

Written submission from

Julien Dupont

MR. LEBLANC: The next submission, H13.169 is from Karen Colvin.

12-H13.169

Written submission from

Karen Colvin

MR. LEBLANC: The next submission, H13.170 is from Corina Psarrou-Rae.

12-H13.170

Written submission from

Corina Psarrou-Rae

MR. LEBLANC: The next submission, H13.171 is from Janine Carter.

12-H13.171

Written submission from

Janine Carter

MR. LEBLANC: The next submission, H13.172 is from the Bruce Peninsula Environment Group.

12-H13.172

Written submission from

the Bruce Peninsula

Environment Group

MR. LEBLANC: The next submission, H13.173 is from Pierre Bouchard.

12-H13.173

Written submission from

Pierre Bouchard

MR. LEBLANC: The next submission, H13.174 is from the National Farmer's Union, Ontario Division.

12-H13.174

Written submission from

National Farmer's Union,

Ontario Division

MR. LEBLANC: The next submission, H13.175 is from Veterans Against Nuclear Arms.

12-H13.175

Written submission from

Veterans Against Nuclear Arms

MR. LEBLANC: The next submission, H13.192 is from Don't Nuke TO.

12-H13.192

Written submission from

Don’t Nuke TO

MR. LEBLANC: The next submission, H13.193 is from Graham Cowan.

12-H13.193

Written submission from

Graham Cowan

MR. LEBLANC: The next submission, H13.194 is from Fahiba Tahsin.

12-H13.194

Written submission from

Fahiba Tahsin

MR. LEBLANC: The next submission, H13.195 is from Carole Winter.

12-H13.195

Written submission from

Carole Winter

MR. LEBLANC: The next submission, H13.196 is from the City of Oshawa.

12-H13.196
Written submission from
the City of Oshawa

MR. LEBLANC: The next submission, H13.197 is from the Committee for Future Generations.

12-H13.197
Written submission from
the Committee for
Future Generations

MR. LEBLANC: The next submission, H13.198 is from Martha Climenhaga.

12-H13.198
Written submission from
Martha Climenhaga

MR. LEBLANC: The next submission, H13.204 is from the Nucleus.

12-H13.204

Written submission from

the Nucleus

MR. LEBLANC: The next submission, H13.209 is from Marius Paul, Poplar Tree Home Denesuline.

12-H13.209

Written submission from

Marius Paul

MR. LEBLANC: The next submission, H13.211 is from Don McGorman.

12-H13.211

Written submission from

Don McGorman

MR. LEBLANC: The next submission, H13.212 is from Stephen Leahy.

12-H13.212

Written submission from

Stephen Leahy

MR. LEBLANC: And the last submission, which is in fact several hundred form letters that were part of a letter writing campaign have been re-grouped into a single submission under H13.213.

12-H13.213
Written submissions from
a letter-writing campaign

MR. LEBLANC: There are no more questions, Mr. President.

I recommend that we close for the evening and we're done with the written submissions.

THE CHAIRMAN: This is a long day, and we will reconvene tomorrow at the usual time, 8:30, right here.

Thank you.

--- Upon adjourning at 9:26 p.m./
L'audience est ajournée 21h26