

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public hearing

Audience publique

December 6th, 2012

Le 6 décembre 2012

Hope Fellowship Church
1685 Bloor Street
Courtice, Ontario

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1685, rue Bloor
Courtice (Ontario)

Commission Members present

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Ms. Rumina Velshi
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M. Marc Leblanc

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M. Jacques Lavoie

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Courtice, Ontario

--- Upon commencing on Thursday, December 6, 2012 at 8:34
a.m./L'audience débute jeudi, le 6 décembre à 8h34

Opening Remarks

MR. LEBLANC: Bonjour, Mesdames et Messieurs. Welcome to the fourth day of the Darlington Public Hearing.

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. I would ask that please keep the pace of your speech relatively slow so that the translators have a chance to keep up.

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

We will proceed today with the remaining oral presentations. This will be followed by a second round of questions from the Commission Members. And we have completed last evening all of the written submissions.

Monsieur Binder, président et premier dirigeant de la CCSN, présidera 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 who are joining us through the webcast and via teleconference.

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

And for those who were not here for the last -- for the past three days, I will begin by introducing the Members of the Commission that are with us today. On my right is Dr. Moyra McDill and Monsieur Dan Tolgyesi. On my left is Ms. Rumina Velshi, Dr. Ronald Barriault and Monsieur André Harvey.

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

So before we start with the interventions, I'd just like to remind everybody that we've allocated 10 minutes for each oral presentation, but it does not mean that we're not going to spend time reviewing the actual submission that was sent to us and we've read every page in every written material that was sent to us. And we are very eager to discuss the submission that came to us. So please help us so we can go through this agenda and allow everybody a fair time for the discussion.

So with this introduction I'd like to begin the intervention, with the first one from Ms. Chaloner -- I'm not sure if I'm pronouncing it right -- as outlined in CMD 12-H13.178.

Please proceed.

12-H13.178

Oral presentation by

Ms. Norah Chaloner

MS. CHALONER: Thank you. As a member of the Guelph Chapter of the Council of Canadians and as a

retired public health nurse, I feel a responsibility to comment on the proposed plan to refurbish nuclear power plants at Darlington.

My years of experience have deeply embedded one fact; the more complexity we have in systems the more risk we take on. The best plans can go wrong often.

In the 1950s I live in a community where Hurricane Hazel raged through with little warning. Ripping out ecosystems and doing damage, as it did to many Ontario communities along the way. It was shocking.

A few years later I lived in Elmira another town in Southern Ontario where the town water for this community was so permanently contaminated by a local business that a pipeline had to be installed from many miles away for a pure source of water and there's no foreseeable future that'll ever be stopped.

I've seen lakes destroyed by toxic effluent and now follow the International Joint Commission of the Great Lakes to keep abreast of many changes happening to affect our life supports of clean adequate water and clean air.

I've read the reports of tritium emissions in air and water. Their impacts compounded by the increased temperature of water returned after use by the cooling towers.

The loss of fish and fish spawn by the thousands because of these facts in the nuclear energy plants is a threat to food security and a problem for the future. The very dependence on a constant supply of water is a huge problem for water security.

We already have stresses on water availability, quantity and quality in many parts of the province and the world.

If one examines the full nuclear picture with full cost accounting, the effects from mining the uranium all the way through the chain to the lack of a safe and secure waste disposal site, then it's clear to see that this energy is not a clean, safe and low carbon option for the future and the risks borne by the public are too great.

So we have the lessons of Fukushima which has been referred to many times, the lessons of Three-Mile Island, countless small incidents in Canada with air and water leakages from time to time, which we hear about sometime later.

We have catastrophic risks in our future and I don't hear any comments about climate change. This week and last week we have a group of international people, politicians and people from all kinds of scientific backgrounds in Doha speaking to the threats in

the future for your children, your neighbours, your grandchildren, whatever, with interactions that we have no controls over.

And I don't hear the Safety Commission addressing the threats from the natural world, Mother Nature. I don't know that anyone on your Panel represents complex -- complexity of systems, systems analysts that look at interactions.

Coming from a medical model I know that there are things that go wrong. When I was a young student nurse at Sick Kids Hospital, one of the first wards I was sent up to was where the newborn babies were in incubators, and I was handed a baby whose mother had taken thalidomide.

You all know what these dear little babies looked like. It was an error that was not predicted, it was a tiny percentage of those mothers who took that drug.

So we cannot go forward without the humble acceptance of the fact that there are unknowns that you're dealing with and a Safety Commission has to be prepared for more of those unknowns.

There's a lot of competence on this -- on your Panel, there's a lot of competence in this room and we expect the highest level of competence when we are dealing with something that has the possibility of huge

ramifications if there is a problem.

But there are still elements that you cannot control, and one of my biggest concerns is that you are not incorporating information about that possibility.

I have friends and family that live within the zone of influence if there is a nuclear disaster or leak or problem of any sort.

I have asked my family members from time to time, "so what preparedness have you been given by your community" and they don't -- they didn't -- they've never -- they say we don't understand, there's nothing that's been told to us to do or to -- you know, it's not addressed.

Quite by chance last night I went back and my grandchildren handed me something that came in the mail that day. It was a little booklet, and the booklet is on emergency preparedness put out by all of these communities. The logo and stamp of all the communities is on the back of the booklet.

Twenty-some pages telling you about different things to do, know where the exit is of your home, those sorts of things. Nowhere in those pages is the word nuclear mentioned, nowhere -- nuclear disaster, nuclear accident, nuclear leak.

I am amazed it could -- it is exactly the

same information the Red Cross will be giving to little communities up in Orangeville or wherever, nothing specific to the biggest concern that we have in this area, where people would be much more impacted by a nuclear accident of any kind.

So that, first of all, is a recommendation that I make to you, that you actually treat this openly and honestly and let the people closest to the reactors know.

The gentleman who spoke yesterday about living with really good produce from his garden or farm -- I'm not sure if it was a farm or garden -- and he's healthy, presumably his family are, that's good. I'm happy for him.

But the families that actually have experienced problems, they're being ignored. And we can say well maybe that cancer was due to something else, that little child, you know. And in fact we do know it's an elusive disease but it affects more and more and more of us all the time.

So any -- like it's over 50 percent now of our population which will have cancer in a lifetime and the fact that it happens with children, probably there is a genetic predisposition in that family somewhere that makes them vulnerable, but the tritium emissions cannot be

ignored and treated as something normal.

We know they're cumulative and cumulative means it's going to impact at some point and for people who have that vulnerability; they're the ones who are going to fall into the category of having the problem.

The Town of Elmira, they -- my father died of cancer, who knows if it was the factory five doors down the street, where they were making agent orange, where they were dumping the refuse into the little creek down the -- behind the factory, the Canica Jade Creek where we all played, where the Mennonite farms further downstream are taking their water, for the meat that you buy to -- the thing is a system's problem and I don't see any information coming into your Panel of experts that are looking at the interactions and the catalyst effects of the problems.

I checked the video online, I have to tell you -- the young woman on the far side, I'm sorry -- you asked yesterday someone who spoke if they've felt confidence having seen that video. I have to tell you, my confidence was destroyed having seen that video.

Every aspect of that video, every shot shows you it is more and more complex. It is an incredibly complex system keeping these power plants going.

Does the name Thomas Homer Dixon mean anything to you people? Have you had him come and speak? He's an expert on systems analyst -- analysis.

THE CHAIRMAN: Okay, are you -- please wind up.

MS. CHALONER: All right.

I would hope that you would have someone like that working with you; I would hope you have someone from NASA working with you. There are complex systems that have failed catastrophically from time to time. Those are the people you need to hear from. Not so much me but people who can show where things can go wrong.

You're charged with looking after the safety of the operation and you ask for facts of lack of safety that would compel you to refuse permission for the recommissioning and refurbishment. But a Safety Commission you must, you must require facts for safety not against safety.

THE CHAIRMAN: Okay, listen, we get -- we get the picture, could you please finish so we can get some discussion going.

MS. CHALONER: All right.

I'm not going to go through the other things because you say that you have read my submission that's helpful.

But first of all, I would hope you have the full environmental assessment, including other experts outside of your particular field, especially on integrated complexity of systems.

I would hope that you would do something about emergency preparedness within the 10 kilometre or whatever the number of kilometres you set as being safe so that families, like my family, would know what to do besides closing the doors. Well for how long? For like - - what's going to happen then? They have no idea so that it isn't on their radar.

THE CHAIRMAN: Okay I think we've ---

MS. CHALONER: Perhaps...

THE CHAIRMAN: --- I think we've heard enough.

MS. CHALONER: All right. If you -- all right.

THE CHAIRMAN: Okay, we've heard enough.

I'd like to open a discussion because I have one particular question. Anybody wants to go before me?

Dr. McDill?

MEMBER MCDILL: My first question is to the intervenor, have you been here all the days? I know you obviously have been here ---

MS. CHALONER: No, I was here yesterday.

MEMBER McDILL: You were here yesterday,
okay.

MS. CHALONER: Yes.

MEMBER McDILL: Thank you.

MS. CHALONER: And I saw a bit of it the
day before, I -- you know, ---

MEMBER McDILL: That's fine.

MS. CHALONER: --- when I was able to.

MEMBER McDILL: Perhaps I could ask OPG to
start then with a brief explanation of how climate change
and just -- you know -- normal extreme weather has been
accommodated in the environmental assessment.

Thank you.

MR. TREMBLAY: All right. Thank you.

Pierre Tremblay, for the record.

I'm going to ask John Peters to talk about
that aspect of the -- John?

MR. PETERS: John Peters, for the record.

As we said earlier in the transcript and
the discussions at this hearing, OPG was required under
the guidance document that was set up for this
environmental assessment, to undertake an assessment of
climate change potential effects, and then to examine all
the ways that those effects may influence plant

performance under normal operations and in the event of accidents.

And we've looked at the global climate change models that are out there. We've examined the literature carefully to understand the range of potential effects.

And then we have gone through and examined all of our plant systems to determine exactly how those changes, for example, high wind speeds, more severe rainfall events, that kind of thing would affect the performance of the plant. And we've demonstrated how there is robustness today and the plant is safe and operating well today. And that it can adapt and respond to these changes over its life and be safe for the future.

So there is a good description of that material in our documentation.

I also want to assure that the -- the intervenor that we have a separate piece of analysis done in safety analysis space which looks at these things from a very technical and engineering perspective, and that too has been referenced in our work.

MS. CHALONER: Where does the human factor come in? There's a professor at University of York, York University in Toronto called Kim Vicente who's written a book called "The Human Factor". And when you tell me that

your technical experts have given you their detailed instructions, I'm concerned that you haven't even incorporated the human factor.

For example, when there's a catastrophic---

THE CHAIRMAN: I thought we'd -- okay, again we've discussed human factor at least in the last two days, in depth. You want to -- you want to just put some information about the human factor and stuff. The intervenor talks about whether you have any system analyst experts around. Can you add some information about that? So OPG, you want to...

MR. ELLIOTT: Mark Elliott, Chief Engineer, for the record.

I make a couple of comments; one is that -- the human factor is, when we talk about these technical reports, yes they do talk about systems and the reliability of those systems and the chance that those systems could fail. They also talk about the human aspect to it.

When human -- when the operators and maintainers are required to execute actions to -- for safety, those actions are looked at in detail to see what would be the human reliability. How often would we get it right; what's the chance that we would get it wrong? If we get it wrong, what's the consequences of that; what are

the barriers beyond that?

So we don't just look at the equipment, we do look at the people aspects and there's quite a lot of study and information on how to do that. We've done it through industry standard approaches, and I know that CNSC staff can comment on that as well.

THE CHAIRMAN: And also make reference where this information is available for -- if somebody wants to read about this, like an intervenor, where can they find it? Staff.

MR. JAMMAL: Ramzi Jammal, for the record.

First I'll start with the complexity of the systems. The intervenors talk about have we done the analysis and do we have system analyst.

Yes, we do. I'm just going to -- not to go into the technical terms or the complexity of what has been done, but what we've done is we put analysis in place to take measures against the unthinkable. Okay.

So what we say, there's a design basis. Beyond design basis and in our analysis we took beyond design basis that will take into consideration the unthinkable with respect to beyond the design of the facilities, so with respect to the events.

So, you know, without going into the numerical values we had a quite extensive discussions

yesterday on the frequency and the numbers what it means with respect to the analysis. And a very complex methodology before we accepted and post-Fukushima this unthinkable has -- it's been expanded. So in other words what we thought before as being part of the existing bubble, the bubble now is bigger to take into consideration, the unthinkable.

I will pass it on to Ms. Kathleen Heppell-Masys with respect to the human factors.

MR. FRAPPIER: Maybe just before we get there, it's Gerry Frappier, Director General Assessment Analysis.

So for the overall system complexity from a technical perspective, we certainly have many, many systems design engineers in different areas of expertise.

We -- part of the -- one of the main functions of the whole suite of safety analyses that are required both deterministic and probabilistic, is to take a look at the interaction between different pieces of, I agree, are very complex piece of machinery.

And in particular, the probabilistic safety assessment that's done is a very structured systematic approach of looking at all the systems and all the interactions between the systems and all the interactions of any failure or combination of failures between the

systems.

And so from that perspective we do get a holistic view of what could go wrong and ensure that there is mitigations to make sure that it's properly handled in a safe way.

For the human factors part and in particular, as was just mentioned, I'll turn it over to Kathleen.

MS. HEPPELL-MASYS: Kathleen Heppell-Masys, for the record; I'm the Director General of the Safety Management Directorate.

I'd just like to point out that at the CNSC we have a strong team of human factor specialists. I have 11 -- a big -- a large team of specialists in that domain.

With respect to what we expect the licensees to do, as I mentioned yesterday, we do require the licensees to have a human performance program, and one of the main objective of that program is to reduce the probability of human error.

As well, human actions and the associated potential for human error are also considered in the human reliability analysis, which is included in the probabilistic safety assessment, as my colleague just alluded to, and that's for the entire plant.

And we also consider the design of the

human machine interfaces which takes, again, in consideration the possibility of human error and the mitigation to address the consequences of such errors.

I hope this helps.

THE CHAIRMAN: Okay. Thank you.

Monsieur Harvey.

MEMBER HARVEY: Merci, monsieur le president.

Do we have somebody from EMO in the room?

THE CHAIRMAN: From Emergency Management?

MEMBER HARVEY: Yes.

THE CHAIRMAN: Emergency Management Ontario? No, but we have some emergency ---

MEMBER HARVEY: Well, I just wanted to ask some questions about the brochure there, because they're supposed to have an emergency plan and emergency preparedness to -- and they say that the public -- they do what they can to inform the public ---

THE CHAIRMAN: Okay, Mr. Sigouin, what about this little brochure that's supposed to be emergency on all events and it doesn't mention nuclear, what about that?

MR. SIGOUIN: Luc Sigouin, Director Emergency Management Programs, for the record.

We know that, as Mr. Ivan Ciuciura from

DEMO (Durham Emergency Management Office) yesterday said, they do do some outreach with the public, either on website and with the pamphlets.

I don't have any further information, if there are additional outreach or outreach pamphlets that have specific information on nuclear. What we can do is we can contact Mr. Ciuciura this morning and we can get back to you a little bit later with that information.

THE CHAIRMAN: Okay, thank you.

I think the intervenor -- you have the last word.

Touch the button.

MS. CHALONER: It's on. Sorry.

The Safety Commission, I understand, is here today to be taking information back, as well as reassuring us. I mean -- I am hearing you as the support panel for the industry, I'm not hearing the concerns that would address the anxiety that there is much in our future that is coming faster and faster. The scientific projections of climate change, catastrophic events, are accelerating.

For example, all of the research you're referring to sounds great. Did it take into account the World Bank report, which just came out this week? This says we're now looking at four degrees of the world planet

heating before this century is out.

We can't even grow most of the food that we have with one more degree temperature, and we're now we're looking at four degrees which essentially means that most of the people are not going to be here on the earth, so --
-

THE CHAIRMAN: Okay, thank you. We heard you, we are collecting information. And yes, the answer is yes, climate change -- it's my understanding -- was done in-depth looking forward.

And I was going to ask, where are those studies available for the intervenor to read on the climate change, for example?

MR. McALLISTER: Andrew McAllister, for the record.

The information that the environmental assessment screening report relied on was drawn from the technical documents that Ontario Power Generation submitted. And those can be found on OPG's website.

And just to give the assurances, there's -- you mentioned Hurricane Hazel, for example, in your introduction, and people have talked about Hurricane Sandy recently.

Hurricane Sandy was a storm of a much lower magnitude than Hurricane Hazel. And Hurricane Hazel is

the storm for which the station is built to withstand and it was a much more higher magnitude storm than that.

So just an example of how those external hazards have been considered in the plant design and in the environmental assessment.

THE CHAIRMAN: Okay, thank you. Thank you very much.

Okay. Sorry about that.

The next presentation is going to be presented by Ms. Stevenson, as outlined in CMD H13.182.

Please proceed.

12-H13.182

Oral presentation by

Brenda Stevenson

MS. STEVENSON: Thank you. Yes, for the record, my name is Brenda Stevenson.

And thank you Norah for bringing up the personal preparedness book which I received on Friday as well. I won't dwell on that, but shocking that there's nothing in there about nuclear, very shocking.

Anyway, good morning. And I hope that this, the last day of the Darlington hearings, will be known as a forum for truth and forward thinking.

But that we need to even entertain refurbishing Darlington is really beyond belief, given toxic health effects of living near the nuclear plant, the \$36 billion price tag, past nuclear debt, waste transportation issues, waste storage that will not go away, problems with old technology, and the failure of government and nuclear industry to consider and plan for the very real possibility of a significant nuclear accident, God forbid.

All of this has been spoken about eloquently and technically during the hearings by many groups and individuals. But I put my money on green renewable energy; wind, solar, water, biogas, and of course, a good dose of conservation.

Warrior activists like Rachel Carson, Rosalie Bertell, -- I hope that you have read their books -- and all of the fine people who work tirelessly, and often without any pay or very little pay, on behalf of the very young, the very old, the very sick, and all of those in between, you are the leaders.

Now, I decided to take more than a passing interest in nuclear power after a vacation I took in September in 2011, in France with my husband. After arriving, we received an email from our daughter after she saw a news alert flash across the bottom of her TV screen.

And the email read something like this, "I'm sure there's nothing to worry about. A nuclear explosion yesterday close to Nimes at the Marcoule Plant in the south of France, hope everything is okay".

As luck would have it, we were 15 kilometres from the site; beautiful countryside, lush vineyards and a nuclear accident. French news confirmed a fire at the site -- at the waste site, one man killed, four others injured. That was it, nothing more.

Locals tried to reassure us that these accidents happen from time to time and that there was nothing to be alarmed about.

But I can assure you that we were a little uneasy about the lack of communication and the possibility that we could be smack in the middle of a very bad situation. After a few days of spinning our wheels, we attempted to salvage our vacation while avoiding the immediate area.

But upon returning to Canada, and with an understanding that we are now all in this together -- you can't get away, there's nuclear plants all over the world -- I made a promise to myself to learn more about the nuclear industry and to fight the good fight. After all, my grandchildren deserved a safe earth to play and grow up in.

And so I ask the nuclear engineers, geologists, epidemiologists, CEOs, facilitators, can you justify the millions of tonnes of toxic waste sites all around the planet -- I know we're concentrating on Darlington, or Darlington here, but with this perspective that I had -- that I picked up in France, all of these toxic waste sites that will simply not go away.

What about the man-made highly radioactive isotopes that hang on for thousands and thousands of years, can we justify this, or the 12 to 15,000 tonnes of radioactive concrete at each reactor site? How much space has been taken up with toxic waste, how much unusable land, how many dead towns and sick people? Clearly we cannot carry on like this.

Nuclear accidents, including tritium releases are occurring more and more frequently in Canada and around the world and yet the CNSC and OPG continue to tell us how safe nuclear power is. And in the unlikely advent of a nuclear -- of an accident, they say the safe CANDU reactors will contain anything harmful. I'm sorry; I'm not buying it.

No system can be perfect and we are playing with fire here. We now know that the Fukushima disaster was human error.

And then there was low-level radiation,

which is not as harmless as it sounds. Low-level radiation causes free radical damage and this damage has an enhanced effect at low doses; changes in red cell permeability, membrane integrity, susceptibility to infection and changes in antibody response and production, all precursors for cancer.

That is why when I hear "safe and low-level" in the same sentence I shudder.

Another insidious example of nuclear by-product, strontium, a radioactive isotope finds its way into human bone marrow, glandular organs, mother's milk, and if that weren't enough, baby teeth.

And so I ask that the Darlington refurbishment not be approved and at the very least a full panel review be ordered. But the mother in me prays that we phase out nuclear power and stop this madness.

I'd like to leave you with a quote.

"Concern for man himself and his fate must always be the chief interest of all technical endeavors [...] in order that the creation of our mind shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations. Elbert Einstein."

Thank you.

THE CHAIRMAN: Thank you.

Questions?

Mr. Tolgyesi?

MEMBER TOLGYESI: The two intervenors today were mentioning these booklets; I'm sorry, who published that?

MS. STEVENSON: Sorry, Durham Region, covering Scugog, Ajax, Clarington, Oshawa, and Pickering.

MEMBER TOLGYESI: Yes.

MS. STEVENSON: Everything but nuclear.

MEMBER TOLGYESI: So far you work these organizations -- where other intervenor was saying also she received some pamphlets and there was nothing on the nuclear. So how far you work with those organizations who published these pamphlets and emergency.

MR. TREMBLAY: Pierre Tremblay, for the record.

Yeah, obviously we work with the Durham Region.

I'm going to ask Jim Coles, our Director of Emergency Planning to speak to this particular pamphlet.

MR. POWERS: Kevin Powers, for the record.

We do work fairly closely with the Region of Durham on its materials.

I have not seen that particular brochure but I do know that they do have a separate booklet that deals specifically with nuclear emergencies that is available on the website and has been distributed.

THE CHAIRMAN: It's still very surprising in this particular region to have a booklet like this with no mention of nuclear. I think somebody -- unless I'm misunderstanding and maybe this other brochure really is the one that's going to be published next, I find it very surprising that there will be no nuclear-specific mention in this booklet.

MR. TREMBLAY: Pierre Tremblay, for the record.

Yeah, I'd agree. I mean we'll go back and look at it. I mean I wasn't aware of this particular product. Obviously the idea is to cover a while pile of things; it ought to be covering this as well.

And, you know, I've seen other pamphlets that clearly lay out -- you know -- our situation and the potential for a nuclear event. So we'll go back and look, for sure.

THE CHAIRMAN: Okay, thank you.

You have the last word.

MS. STEVENSON: Yes, well, I hope you do look into that because I haven't seen anything myself and

I think it was a glaring omission.

That's all, thank you.

THE CHAIRMAN: Okay, thank you. Thank you very much.

The next submission is by the Canadian Coalition for Nuclear Responsibility, as outlined in CMD H13.155.

And I understand that Dr. Edwards will join us through teleconference. Dr. Edwards.

12-H13.155

**Oral presentation by the
Canadian Coalition for
Nuclear Responsibility.**

DR. EDWARDS: Yes, Dr. Binder, how are you?

THE CHAIRMAN: I'm fine. How are you?

Please proceed.

DR. EDWARDS: I'm fine, thank you. And I would like to thank very much the CNSC for providing this opportunity for people to come and express their views on this very important subject.

Also, if I may say so; I find the procedures over the last few days have been much more interesting and involving and I think mutually respectful

in general than has always been -- that has not always been the case in the past and I'd like to compliment the CNSC for providing this opportunity for people and for being so patient.

Basically, we all want nuclear power to be safe. We don't -- nobody wants nuclear power to malfunction or to cause damage to the environment or to people.

However, it does have an enormous potential to cause damage. And ultimately the decisions are political. Society as a whole has to decide whether it is willing to take these risks and what conditions it wants to impose upon those risks.

I believe that -- for example, just last week in New York, the New York Energy Regulators told the power companies to develop plans to keep the lights on in case the giant Indian Point nuclear power plant is shut down. This is from newspaper accounts.

"New York Governor Andrew Cuomo wants the two reactors at Indian Point shut [down permanently] when their operating license expire in 2013 and 2015 in part because the nuclear plant is located in the New York metropolitan area, home to some 19

million people. The governor has said even the most unlikely possibility of an accident is too much in the heavily populated area."

So I think that we have to recognize, especially post-Fukushima that we need, really, to have sound policies guiding our energy system and the role that nuclear is going to play, and if nuclear is going to play a role how it's going to play that role.

And my biggest concern with the current plans to refurbish the Darlington reactors, to which I am -- our organization is opposed under the current circumstances -- is, it is the first big project to extend the role of nuclear power on the Great Lakes since Fukushima. That is, there were other projects that were underway, such as the Bruce refurbishment but this is the first real initial movement towards extending the role of nuclear power on the Great Lakes.

And we do not have any specific political direction for this. There are many questions that should be addressed; do we really want to take the risk of having nuclear plants on the Great Lakes when we've seen the huge volumes of contaminated water that have had to be dumped into the ocean and have leaked into the soil from the Fukushima disaster.

Do we want to run even the remotest risk that this kind of spillage into the Great Lakes could occur, affecting the whole Great Lakes and the St. Lawrence River Basin possibly.

So there's also the question about land contamination, because of the population density. Do we really want to have nuclear power plants so close to some of the most largest population centres and areas which are very important for our economy as well, given the fact that there is the potential for large areas of land to be uninhabitable for a considerable period of time.

Now, I participated in a number of hearings back in the 1970s, and this is what the select committee on Ontario Hydro Affairs said in June of 1980, following 15 weeks of hearings in which they interviewed all kinds of experts, from the United States, from Atomic Energy of Canada Limited, from Ontario Power -- Ontario Hydro and others from outside the industry.

Their conclusions in the safety of Ontario's nuclear reactors, a publication of June 1980, quote:

"It is not right to say that a catastrophic accident is impossible; [...] the worst possible accident [...] could involve the spread of

radioactive poisons over large areas, killing thousands immediately, killing others through increasing susceptibility to cancer, risking genetic defects that could affect future generations and possibly contaminating large land areas for [future] habitation or cultivation."

Now, one of the things that is, I think, distressing to people who intervene in these hearings is that they do not hear a frank admission from the CNSC staff or from the Proponent that in fact this is the fear, this is the concern that it could in fact happen under the worst circumstances if the emergency safety systems do not all function as planned.

And that being the case, it becomes a matter of public policy as to whether it is wise to accept that risk, particularly with regard to the fighting and where precisely these reactors are going to be located.

So what I'm asking is that the -- in previous hearings -- and by the way, I might add that, Dr. Binder, you, yourself have said something similar in recent hearings. I remember back in the St. John, New Brunswick hearing you said that ultimately whatever the probability is we want to know that we can handle the

worst-case situation, the so-called doomsday scenario.

And the question is, have we really addressed that as a genuine possibility or is both the Proponent and the staff using these mathematically calculated probabilities as a kind of a hide -- as kind of a shield to hide behind in terms of dealing with the worst possible accidents?

The other day, yesterday, I heard Shawn-Patrick Stensil mention a couple of accident scenarios identified by OPG in which there would be significant offsite radiation releases. And Dr. Binder, you, yourself and one of the other Commission Members asked for a clarification as to what exactly -- how does that happen, how does the radiation get out there and nobody gave you a straight answer on that. That bothers me. Because I think you should be able to get a straight answer to that.

So to move on, what I'm saying here is that to somebody outside the process, watching it from outside, it appears that the CNSC staff and the Proponent are basically shoulder-to-shoulder singing from the same hymn book and giving the same kind of answers.

In fact, more often than not, it seems to be CNSC staff who are explaining and even justifying things that are in the environmental assessment or the application.

And one wonders well, gosh, where is the -- where's the dialogue? I mean, one would kind of think that CNSC staff, representing the public interest, would be cross-examining the Proponent and holding the Proponent's feet to the fire and saying, how do you justify this. But no, we find them both acting together in concert. And I think this puts the Commission in a very difficult position because they're really only getting one story from both parties.

Now, what I'm -- what CCNR is asking is that the Commission actually recuse itself from deciding on whether to extend the lifetime of these reactors by refurbishment, pending a political guidance from our political system and from our population.

I was told in the St. John, New Brunswick hearings by Dr. Binder that the CNSC does not report to the Minister of Natural Resources, but rather reports to the Parliament of Canada through the Minister of Natural Resources.

So I asked myself, well what exactly to you report to the Parliament of Canada? Should you not be reporting to the Parliament that this is an important juncture in the history of the nuclear program in Canada and that we need clear guidance as to whether we want to continue to do certain things.

For example -- just to give you a couple of examples, which are in my submission, my written submission, the high level nuclear waste problem is still not solved. And back in the seventies when this program was launched, this research program into geological storage, it was understood that there would have to be a moratorium on new nuclear reactors if -- unless this problem was solved. Well, it's still not solved.

Does the Parliament of Canada want to go ahead with new reactors and refurbishing old reactors without having even broken ground on the high level nuclear waste problem.

As we've seen in the United States, the Yucca Mountain project has been scrapped and in fact, the U.S. Nuclear Regulatory Commission has suspended final decisions on licensing for both new reactors and for refurbished reactors for a couple of years, pending some kind of political and regulatory resolution of this problem.

I believe that the CNSC should be reporting to the Parliament of Canada that this is a consideration that requires political direction and that there should be a mechanism by which our democratic system can provide that direction.

Another example is the safe and timely

dismantling of nuclear reactors at the end of their lifetime has not yet been demonstrated. As a result, even the cost of nuclear power is not really known because we know that the cost of dismantling these reactors is going to be very substantial, possibly much more substantial than has been estimated in the past.

And we do have a possibility of demonstrating dismantling on some of the old reactors that have been shut down for decades, like the Douglas Point reactor, the NPD reactor, the Gentilly-1 reactor in Quebec. But pending some greater knowledge about the dangers and the cost of dismantling these reactors, I don't think we should be, in good conscience, we cannot be just simply giving a green light to extending the lifetime or allowing new ones.

More important points that I mentioned earlier about the fighting; do we want to continue to jeopardize these large population centres and the Great Lakes?

And I'd like to mention one other issue as well, which is a generic CANDU safety issue that has been struggled with for decades and that is the positive void coefficient of reactivity, which means that when you have a loss of coolant accident you get a power surge at the same time.

For this reason we have two independent, fast-acting shutdown systems in order to try and ensure that this power surge will not get out of control because it is well recognized that if the reactor were not to be terminated within two seconds you could have very serious consequences.

Well there are, as I understand it, technical means for eliminating this problem at the source by using different fuel, by -- it's called a low void reactivity fuel. And the CNSC and the Proponent have decided not to do that but to live with the risk of this positive void reactivity coefficient by putting all their reliance on the mathematics of their analysis and also on the efficacy of these fast shutdown systems.

Well, I think that is again something that deserves to be considered at a political level. Does society want to insist that the problem be eliminated? Or is society willing to live with the problem hoping that these not-always-available shutdown systems will be -- will function infallibly in the case of an accident?

So in conclusion, the Canadian Coalition for Nuclear Responsibility urges the CNSC not to accept the environmental assessment report as a justification for authorizing the refurbishment and continued operation of the Darlington reactors because of fundamental unsolved

problems regarding catastrophic accidents, the long-term management of irradiated nuclear fuel, the safe dismantling of defunct nuclear power reactors, unresolved CANDU safety problems, including particularly the positive void coefficient of reactivity.

And finally, the all-important sighting question as to, you know, people here on this side of the world often say "My God, why would they build nuclear reactors in Japan so close to the earthquake risks, to that part of the Pacific Ocean". Well, perhaps our grandchildren will be asking us, "My God, why would people build nuclear reactors right on the Great Lakes where it's the most precious water resource we have, and why jeopardize that?"

So that's my conclusion. Thank you, sir.

THE CHAIRMAN: Thank you. Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Can we start, who wants to go?

Dr. Barriault?

MEMBER BARRIAULT: Thank you, Mr. Chairman.

Does CNSC -- the Proponent mentioned the low void reactivity fuel. I guess it begs the question, why isn't it being used in our reactors or is there a need for it?

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

I must -- let me start first by complimenting Dr. Edwards on the way he presents the information, in a manner that probably the public understands but it's not really presenting the whole fact relating to the PCR.

The mention of the positive coefficient reactivity which is, as he accurately calls the generic action item, has been raised internationally and has been closed internationally by the CNSC.

The CNSC is a signature to the convention of nuclear safety and the technical debates take place by peer review, independent other countries. And at the last convention of nuclear safety, the CNSC presented its action and its -- the systematic approach and what's being done with respect to the positive coefficient reactivity and the issue internationally has been accepted and closed. So the PCR itself, the generic action item is a -- it's a thing that's always being raised by Dr. Edwards and it is closed internationally now.

On the specific, I will ask Dr. Rzentkowski or Dr. David Newland or actually Michel Couture -- Dr. Couture to provide the specificity with respect to the PCR. This is not a new phenomenon. We know the process.

DR. COUTURE: Thank you. Michel Couture, Director of the Physics and Fuel Division, for the record.

Short answer and then I'll explain a bit more, the use of the low void fuel would not eliminate the fact that the CANDU has a positive void reactivity coefficient.

As Dr. Edwards has mentioned, what does it mean to have a positive cooling void reactivity coefficient? It means that if you have a loss of coolant of accident, the voiding will translate into an increase in the number of neutrons, which translates into a number increased in fissions and therefore, a power surge.

The IDR and Dendy, as the safety analysis demonstrates, the shutdown system will be activated. Current safety analysis demonstrates that the shutdown system will be activated and safety limits will be met.

Now the concept of the low void fuel is to have, essentially, the same -- it's a 37 element bundle and a central element is -- we -- the designer introduced some neutron absorbents -- absorber materials that absorb neutrons in the central element. And in order to compensate for that, they had to increase the enrichment. So it's about 1.2 percent enrichment for the rest of the bundle.

This bundle has no effect during normal

operation but if you had a loss of coolant accident, what would happen is that, like I said, the neutron population increases but now, since you have an absorbent at the centre of your bundle, these neutrons would be absorbed. So what it does is, the power surge would still be there but at a much lower rate and the shutdown system would be activated. And your safety limits would be met but with a large margin.

DR. EDWARDS: May I say something on this?

DR. COUTURE: Yes please.

DR. EDWARDS: This is exactly my point. I don't think the CNSC is an elected body. I don't think the CNSC has the right to make such decisions for the population at large. I think the CNSC should be reporting back to the political masters and saying look, this requires some political consideration.

Do you think -- this is not only technical and scientific and engineering problem, this is a problem that could have consequences of major proportions, under the worst circumstances. So does our political system think that we want to accept a larger risk and put most of our reliance on the shutdown systems which are not always even available, as I understand it, or do we want to provide a much greater margin of safety at some extra expense, by using this type of fuel? Now I realize this

sounds like a technical question but this is the whole point. At some point, society itself has to be involved in these decisions. At some point, our political system has to decide which are reasonable risks to take and what level of reasonable risk do we want to accept.

Now in the past, I have asked the CNSC to recommend a national public inquiry into the future of nuclear power so that we can have a democratic process which will educate not only the public. I heard the other day Dr. Binder mention how disappointed he was that people are so poorly informed about nuclear power.

Well this also applies to our elected representatives. If we had a process whereby all of the benefits and all of the risk could be put on the table in a coherent and meaningful way, we would have a record to allow society, as a whole, to make certain decisions.

And I don't believe it's up to the CNSC, as an unelected body, to make these decisions on behalf of society but rather, to refer back to Parliament those decisions which may have important societal repercussions

DR. COUTURE: Thank you.

DR. EDWARDS: --- such as whether or not to use a low void reactivity fuel.

THE CHAIRMAN: Okay, I give some reaction

first from OPG and then Dr. McDill.

MR. TREMBLAY: Pierre Tremblay.

Just to get back to the matter at hand and the question that the Commission asked, just want to make a point that, you know, the Darlington Plant and the Safety Case is assured. The plant has adequate margins. It meets all the safety requirements. We have fast acting safety systems and we meet all the requirements. And so that's an important point that we need to understand and put on the table.

In terms of low void fuel and that issue, let me just ask Mark Elliott, our Chief Engineer, to talk a bit about the work we've done in this area.

MR. ELLIOTT: Mark Elliott for the record.

To go to a new type of fuel would be a major change and a major change in our design. It would go to enrich -- some enrichment. We've talked a lot about natural uranium fuel. So this would be a major change and when you look at the safety margins that we have, they're solid.

And every time we look at this issue, we're looking at it again from a point of view of large- break LOCA, that's an issue that has come before you before. When we've looked at that in detail, we still have significant margin.

So this is not an issue that effects our safety goals, as Mr. Tremblay mentioned. We meet those with margin and there's really just no reason to go to low void reactivity fuel.

THE CHAIRMAN: Thank you.

MR. ELLIOTT: Can I just make one other comment? I have to correct the intervenor of operating without shutdown systems. I've been a shift supervisor at Pickering, I've been a shift supervisor at Darlington, I've been a site Vice President, and as Chief Engineer, we would never operate a reactor without a -- with the shutdown systems unavailable. That would not happen.

THE CHAIRMAN: Okay. Dr. McDill?

MEMBER MCDILL: Thank you, that addresses one of the questions I was going to ask. Dr. Edwards, where would you propose that the enrichment of the fuel be carried out?

DR. EDWARDS: Well we have no enrichment plans in Canada so that -- it would -- it would be purchased from the United States. This was seriously considered by Bruce Power and in fact, it was even a design requirement of the proposed advanced CANDU reactor. The advanced CANDU reactor would not even function without this kind of low void reactivity fuel.

And so one of the reasons for the advanced

CANDU reactor design was precisely to move away from this positive void coefficient problem through a better fueling regime and through other design changes which would seriously reduce this problem of the -- because it is a problem.

Now with regard to the unavailability of the safety systems, there used to be published unavailability statistics on all of the safety systems, including the emergency core cooling system and the shutdown systems. I have records of these in the past.

These unavailability statistics are no longer published and I'm wondering why not because there are periods which are discovered after the fact when one or more safety system may not have been available. Not intentionally of course, or not at anyone's knowledge at the time, but later on, it is discovered that there were unavailability of certain safety systems. Are we being told now by the Proponent that these systems are always, 100 percent available and there are no unavailability statistics at all?

THE CHAIRMAN: Just to clarify the question, there are literally 100s of safety system. I thought we were talking about the shutdown.

DR. EDWARDS: Yes, I'm talking about the shutdown system.

THE CHAIRMAN: Right. Well I'd be surprised if they were unavailable. Can somebody -- staff, would we ever allow for -- would you ever allow for unavailability of the shutdown system?

MR. JAMMAL: Ramzi Jammal for the record.

The answer is no, we will not allow them to operate without the availability of the shutdown system but I would like to counter with Dr. Edwards.

He is manipulating -- a lot of the reports were after the fact. When there is a mention -- as you mentioned, there are multiple safety systems, okay? And the key element is, no reactor will be allowed to operate without the safety system is fully functional or in operations.

THE CHAIRMAN: But is there are a time when one sort of failed and then you had to do an outage?

MR. JAMMAL: Of course, that's why the reactor always goes into a shutdown state. I'll pass it on to Dr. Rzentowski, Director General of the -- Director of Power Regular. As a matter of fact, we can pass you to Mr. Webster whose Director of the Darlington.

MR. WEBSTER: Thank you Mr. Jammal. It's Phil Webster, the Darlington Director.

Let me try to sort through the issues here. There are four special safety systems; two shutdown

systems, emergency coolant injection and containment. And there are many thousands of tests every year. Essentially every shift in the station tests some part of one of the special safety systems. When a test is being performed on a shutdown system, for example on one of the channels, the channel is set to a tripped state before it's tested, so in other words, this is set to the safe direction before the test is performed. This sometimes leads to announcing it as a serious fault on another channel while the test is being performed. If there is an unavailability especially of the ECI or the containment system and by unavailability, I normally refer to a loss of redundancy or perhaps a reduction in its full capability, the rules require that to be fixed within a defined time, often 8 hours or 24 hours or the station must be shut down.

So the station never operates without shutdown systems. It may operate for a very short period with a reduced availability of emergency coolants or containment and it's not the full containment. It's often something like an airlock door seal.

THE CHAIRMAN: So just to close this because we should move on to other items that Dr. Edwards raised. I'd like a clear statement, is the low void reactivity with enriched uranium a safer system than the current existing system?

MR. COUTURE: Michel Couture, Director of Physics and Fuel Division for the record. The -- the safety if you're asking if it's safer, the experience we had so far was -- was with two channels in Bruce Power. We've never looked at the whole safety case of the low void fuel, so the safety if you ask if it's more, it's safer, we would have to look at all the implications of changing the fuel to a low void fuel.

THE CHAIRMAN: Dr. Edwards seemed to indicate or at least suggest that it would be a safer system ---

MR. COUTURE: Well, like I mentioned that the -- the idea behind the low void fuel is, as an observant, would reduce the -- the power surge. So if you ask if that -- that is safer, that would certainly accomplish that task, but you have to look at the whole thing. Do we have already enough margin? There's a whole project right now looking at the large low cut. And we are looking at a new analysis framework because the current analysis framework has a lot of, various assumptions and they're like instantaneous break of large pipes. Of course, if you put that in your analysis, instantaneous breaks of large pipes, you'll have huge loss of coolant, however we're looking at fracture mechanics, probability of breaks, is this realistic and so on.

So we're -- we're looking into this and the low void fuel has been put as a -- as a possible option should this analysis cannot be supported on the strong technical basis. So the work is underway right now. There's a huge effort in the industry.

THE CHAIRMAN: So, but if you actually reach the conclusion that it is, I'm still struck, so is it easy now to buy enriched uranium from the U.S. and ship it over to Canada if we needed to, I'm just hypothetically?

MR. JAMMAL: Well, I won't, it's Ramzi Jammal for the record. I won't call it, it is easier, well, it's, we will have to have the import/export agreements, but your question, is it safer, the answer is going to be just as safe as. At minimum, it's going to be as safe as what it is right now. Otherwise we're not going to allow it to -- to be licensed. So the facility as licensed today is safe. Any new modification, enrichment or not, must be an equivalent to safety to what we currently have. The debate is it safer or not, the issue -- that's not the issue here. Is it going to be safe? It must be at minimum equal to what we currently have in safety.

So regardless of what -- what's in it or not, so the -- the composition is not the issue here is,

as Dr. Couture mentioned, it is the safety case, but it must meet the safety requirements, it doesn't matter what it is.

THE CHAIRMAN: Okay, last word on this.

DR. EDWARDS: Okay, for me?

THE CHAIRMAN: No, just a second, just wait a second, staff is still ---

MR. RZENTKOWSKI: Thank you very much.

Greg Rzentkowski for the record, we have to realize that -
- this point has been discussed this morning already. A reactor is a very complex system. It behaves in a complex way. It breaks in a complex way. We talk also about the probabilistic safety assessment. It has to be realized that in probabilistic safety assessment we evaluate hundreds if not thousands of different initiating events.

Now this is only one accident scenario we are discussing here, a result of positive void radioactivity. So that's why it's very important to assess the overall safety case in a very holistic way.

It also has to be recognized that positive avoider activity manifests itself also for the enriched fuel. It manifests itself only during the over-cooling transient, not overheating transient. So, once again, I would like to stress the fact that the overall safety case is what counts and we have a very rigid safety case right

now for operating Candu reactors.

THE CHAIRMAN: Okay.

DR. EDWARDS: Okay, I -- as an intervenor, I find it not reassuring that the -- that the CNSC staff is not willing to say that -- that the overall judgment regarding low void reactivity fuel has been that it would be safer because this is one of the selling points of the advanced Candu reactor design. They were selling it on the basis that -- that this was going to be safer, that they were going to achieve even possibly a negative reactivity coefficient which would mean that instead of getting a power surge, you get a slight power drop which would be a lot safer. So the idea that the staff is not even willing to entertain the idea that something could be safer than something else bothers me enormously because safety is not an absolute and every time that they have performed analyses, I've been involved in analyses regarding the low, regarding the positive void coefficient of radioactivity going way back to the 1970s.

This was brought up during the Porter Commission hearings in 1977-78 and every time that there has been a reanalysis which led to different results regarding the effects of the positive void reactivity coefficient, they've always been worse for the safety case. In other words, time and again on several different

occasions, the CNSC staff has found that previous analysis was in fact wrong and was not as conservative as they hoped and that the consequences of a loss of coolant accident could be in fact considerably more challenging to the safety systems than previously thought. I believe that sheer honesty requires an admission that that is the case.

THE CHAIRMAN: Okay, staff, last word here.

MR. JAMMAL: Ramzi Jammal for the record, I'm pretty sure Dr. Edwards is -- is -- knows that every design in every reactor has a PCR factor. We have with us Dr. Rzenkowski who was the authority responsible for the review of the CR and I will pass on to Dr. Rzenkowski.

THE CHAIRMAN: No, it's a little bit -- we got to move on. Monsieur Harvey, what's your final question on this please?

MEMBER HARVEY: Just one question because all the security is based on the shutdown system, mainly in the shutdown system. So my question is, are those systems well protected and located in such a way that any accident could not nullify or stop the operation of those systems?

MR. TREMBLAY: Pierre Tremblay for the record, you know, the systems you are talking about are fully independent. They're located in different areas so

that a common load event doesn't impact on them. So systems are very reliable. They're tested I think, Phil Webster talked about the testing regime. They're tested every day on a regular basis. So, you know, I guess the one comment I would make is that, you know, the ECR is a completely different reactor design. So you're talking really apples and oranges here. Our -- our plants are safe. They remain safe. Should we decide to go to a different type of fuel, we would only do so after a significant analysis and looking at the implications around managing and operating a plant.

And so, and we wouldn't introduce it unless we thought it was as safe. That's the comment ---

THE CHAIRPERSON: Okay, let's move on to other, Ms. Velshi.

MEMBER VELSHI: Dr. Edwards, one of the other issues you raised was the uncertainty around the dangers and cost of dismantling nuclear power plants. I will ask staff in OPG because last night we heard that decommissioning costs and plans were based on actual international experience and we recognize we don't exactly have that in Canada to give us specifics on that. But I wanted to confirm with you that this issue you have stands whether we refurbish or not, right?

MR. EDWARDS: Well, it does stand whether

you refurbish or not, but it does affect the ultimate safety of the whole system. Here, for example, in Quebec, when we have decided not to refurbish and I believe the Ontario Power Generation has also decided not to refurbish the Pickering B reactors, so we are going to be facing this -- this problem of dismantling. Now here in Quebec, we recently heard from the chief executive of Hydro Quebec that the cost of dismantling the Gentilly 2 reactor is now estimated by him as being close to \$2 billion which is way more than -- than what was filed by the -- in the official documents to the CNSC as to what they thought at that time that it would cost for dismantling Gentilly 2.

Also, what I find is strange is that they say now, here in Quebec, and also in their plan that they submitted to the CNSC, that they would not dismantle it until they wait for 40 years for the radiation levels to decline -- 40 years.

So this of course, pushes the day of reckoning way off into the future, whereas, with the refurbishment, they send people in right away.

And in large measure, you might say the refurbishment of a reactor is a kind of a mini-decommissioning, because the workers are going right into the most radioactive part of the core and they're taking out of the reactor these old, highly radioactive tubes --

the pressure tubes, the calandria tubes, and so on.

So why they have to wait 40 years for dismantling and yet they can do the refurbishment right away, to me doesn't seem to add up.

What I'm concerned about here is that we're talking about a very large and uncertain future cost which hasn't been factored properly into the equation.

And of course, in terms of the CNSC, the greatest problem is not so much the cost, because that's not supposed to be your concern, but the worker safety and the environmental safety, and where are all these thousands of truckloads of radioactive rubble are going to go.

THE CHAIRMAN: Staff?

MR. ELDER: Peter Elder, for record.

So in terms of the costs of decommissioning, as we've said before, these are based on -- the estimates are based on the real cost of real projects in -- mostly in the United States. But they're -- the costs are based on the real examples of what it costs to decommission and they are updated every time there is new data available.

There is a difference and as Mr. Edwards -- what assumptions the licensee makes in their decommission plan. So if you said -- and Hydro Quebec used to say, I'm

going to -- up until a few months ago -- I'm going to refurbish the plant, operate it for additional 20 years, then the time that you need the decommissioning plan is not now, it's in -- decommissioning funds is not now, it's in 20 or 25 years.

That obviously makes a difference in your cost estimates, because they do account very conservatively for growth of any money.

In terms of -- you raised in going back in; one of the things the plan also has to do and cost, is the disposal of the waste. Now again, you said in terms of what is the -- from the CNSC perspective, these are not -- there's lots of international experience on decommissioning. The radiological hazards are well-known, but in every single case, you have to go in and assess them on a case-by-case basis.

So yes, Hydro Quebec has a lot of work to do to go and assess what risk are there and how they're going to manage those risks.

THE CHAIRMAN: Did they submit a plan for decommissioning? Do they have to submit a plan for approval? I don't know where ---

MR. ELDER: Yes.

THE CHAIRMAN: --- Gordon Edwards is getting his numbers from, but I understand that those

numbers have not been decided until they come up with a plan; is that not correct?

MR. ELDER: They -- what they're now is -- Hydro Quebec has given us their approach, their strategy, they have not given us a detailed plan.

So right now, all we can say is these are the numbers that Hydro Quebec is making for financial purposes. We have not seen their reanalysed plan with their new assumptions.

THE CHAIRMAN: Okay. Ms. Velshi, that's it? Anybody else now? Some more questions?

Dr. McDill?

MEMBER McDILL: But in the normal process of developing a decommissioning plan, is it not normal to allow for a certain period between shut-down and the beginning of decommissioning? And that's on the order of several decades typically, is it not?

I'll -- maybe I should look at OPG for that, for example, with yours.

MR. TREMBLAY: Pierre Tremblay, for the record.

Yes, that's correct. And we have a -- you know, given the unique nature of the business, we do have funds set aside. We talked about this in earlier days and we have a very good idea of what the practices are

globally and have worked with them.

So -- but typically, as is our plan -- and some of this is covered in the EA as required -- we'll -- the plans are to have a period of several decades before the actual physical dismantling.

We can get into more details, but that's -- you're correct.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Mr. Edward mentioned that the -- Dr. Edward mentioned that the document that has been presented yesterday -- the OPG document that has been presented yesterday by Mr. Stensil could -- it appears that the document is on internet but could OPG table that document?

MR. TREMBLAY: Pierre Tremblay, for the record.

Yes, we can. We will do so.

MEMBER HARVEY: Thank you.

DR. EDWARDS: Would that be on the website then, could I access it?

MR. TREMBLAY: Pierre Tremblay, for the record.

It's already available on the website.

DR. EDWARDS: Okay.

THE CHAIRMAN: Okay. Can -- you know,

sometimes in the mountain of data that's available, can somebody find the document because we want to make sure that this document that was very -- the centre of discussion yesterday, as discussed by Greenpeace, is available. We would like to know where you can find it. Okay, so because it was -- all right?

DR. EDWARDS: May I also say that I will send to the Commission -- because it's been challenged this question of the unavailability of the safety systems including the shutdown systems -- I have statistics from the past showing on a yearly basis for the different reactors, the unavailability of the four primary safety systems which are the emergency coolant injection, the containment, and the two fast shutdown systems, STS 1 and STS 2. And I will send those to the Commission through Dr. Binder so that -- I'm puzzled as to why those statistics are no longer available. They used to be published all the time.

MEMBER McDILL: Can we get a comment on that from staff, please? I think that's -- it's a critical thing for the community to...

MR. WEBSTER: Sure, it's Phil Webster, for the record.

As the Commissioner is aware, we have a regulatory document, S99, that requires certain things to

be reported by the licensees to the Commission.

One of those things is an annual reliability report which includes the unavailability, the actual past and the predicted future unavailabilities of the four special safety systems.

DR. EDWARDS: Oh, all four of them, okay. So there are unavailabilities?

You see, the reason why this is important is because in the probabilistic safety analysis you have to assign a probability for a safety system failing. And that probability has to be measured against actual performance.

So if you're going to say that a probability system -- that a safety system is going to fail once every 100 reactor years or once every 1,000 reactor years or whatever, then you have to be able to verify that against the actual record. That's why you need to have these unavailability numbers. Without the unavailability numbers you cannot really test the realism of the probability calculations.

MR. WEBSTER: Phil Webster, again, for the record.

Yes, absolutely. That's why they are measured by the licensees and reported to the regulator. And we have our annual report on the safety performance of

the nuclear power stations. And what we report in there -
- and I can't be too clear on the specifics -- is where
systems have been unavailable. The Darlington ---

DR. EDWARDS: Oh.

MR. WEBSTER: --- special safety systems,
all four, have to meet a target of 10 to the minus 3 --
that is they must be ---

DR. EDWARDS: Right.

MR. WEBSTER: --- unavailable, left in a
one and one thousandth of the time.

THE CHAIRMAN: And those reports -- he
keeps making the reports weren't published and they're not
published now; are they still published? What are we
talking about there?

MR. WEBSTER: The reports are publically
available.

DR. EDWARDS: And it does list the
percentage of unavailability, the measured percentage of
unavailability of each of the four safety systems?

MR. WEBSTER: It's Phil Webster, for the
record.

I don't have any with me, but the practice
has been to calculate the actual past unavailability and
then predict the future unavailability.

THE CHAIRMAN: OPG, do you know if they are

available?

MR. TREMBLAY: Pierre Tremblay, for the record.

I think we report this to the CNSC on a quarterly basis as well, so all of this information is available.

THE CHAIRMAN: And yes, we'll check. We'll -- I guess -- could you check and let us know?

MR. TREMBLAY: Pierre Tremblay, for the record.

DR. EDWARDS: Do that because ---

THE CHAIRMAN: Please check and then let us know, okay?

MR. TREMBLAY: Pierre Tremblay, for the record.

Just -- I just wanted to be clear on the request you've made and the information.

There are actually two documents that are relevant to the discussion yesterday. The first is the -- is the report in question, in terms of the results and the probabilities. And the second report is a technical basis for selection of the reactor accidents for the Darlington environmental assessment, and both of those documents will be made available to support this discussion.

THE CHAIRMAN: Okay, thank you.

Dr. McDill?

MEMBER McDILL: Maybe OPG did comment on the comment just made by staff on -- Dr. Edwards was asking you -- you were talking back and forth but perhaps it's been clear. Maybe it's been answered by staff.

THE CHAIRMAN: Anybody else?

Okay, you know you keep mentioning the political route and I agree with you. I don't know if you heard the statement that in terms of the big energy policy, you heard there's a big debate now politically whether Canada should have an energy policy.

We are not going to deal with this. I don't know which government will deal with this but it is not this, the mandate of this Commission.

Same thing with the Ontario government future about the energy mix, they have whole different agency, it's called the OPA. They have the Ministry of Energy and it's going be the Ontario government who decide this.

We -- our mandate is very clearly specified in legislation and we are just following our legislative responsibility. And I got to tell you that if you want some of those -- again, review of the whole nuclear, you should approach Ministers. They are the people who report to Parliament on policy issues not on administrative

legislative issues.

So I'm not going to argue with you whether it should be done should not be done, it's just that we are the vehicle for doing it.

But thank you for the -- for the comment and actually you have the last word here, Dr. Edwards.

DR. EDWARDS: Thank you very much.

Yes, well although energy policy is a provincial responsibility nuclear policy is a federal responsibility. There are also nuclear -- effects of nuclear power offshore, for example the effects on the United States in the event of a major accident. This would not be confined to one country very likely. We're not like Japan; we're not an island.

So I do think that -- that when you have a major political policy considerations -- my fundamental point is that these decisions about safety are not just technical and scientific but they do involve judgment. And I don't think the CNSC has really got a mandate from the -- from the population of Canada to make those judgments on their behalf.

I do believe that this is civic duty of all citizens to report when something really needs to get a proper policy attention.

And since the CNSC says that it reports to

Parliament, I'd like to know what do they report to Parliament? And if there's anything that should be reported to Parliament is that there should be some Parliamentary concern about coming up with some kind of system for reviewing Canada's policy on nuclear power because frankly, it never passes through the minds of most of the politicians in Ottawa. It's not an issue.

And I do believe that it's up to the CNSC, I think that the politicians in Ottawa and people -- political representatives around, even the provinces, depend heavily on CNSC's judgment. I think that at some point the CNSC should be saying, look we can make the best technical and scientific judgment but when it comes to policy decisions it's really a political matter and we need to get the guidance from the policy makers, not -- we're not going to set those standards. We're not going to set those guidelines.

THE CHAIRMAN: I think we are in agreement it's just what a definition of policy is where we are -- sort of differ.

The moment you mention the word policy, Ministers don't want to hear from me. The policy domain is their responsibility. What they're looking for us is, you know, to administer our role in legislation which means if Ministers and government decide to build a

nuclear facility, CNSC makes sure it's done safely.
That's it. That's all.

And, you know, we are not going to go into discussion of any policy issues associated with whether we should build or not, et cetera.

So that's the difference and I encourage you -- that if you feel strongly about -- that require fundamental a new -- I don't know -- task force group et cetera, Commission, you need to talk to the political ministers, either provincial.

The new minister -- the new government in Quebec did not phone me up and say do you think we should stop the decommissioning of Gentilly-2. They decide on their own, all by themselves. They didn't ask technical advice from us.

And I am sure that the minister of -- the government of Ontario will not phone me and ask, what do you think about whether we should refurbish or not refurbish.

So I'm just trying to tell you that if you want those issue to be addressed you are -- they're not going to be addressed by us.

Dr. McDill?

DR. EDWARDS: Thank you, Dr. Binder.

I just would like to say that no it's --

the shoe's on the foot; it's not a question of the government asking you what should be the policy, it's on the contrary, you asking the government what should be the policy. They're the policy makers.

And just as we heard at the beginning of my presentation, New York Governor Andrew Cuomo has decided that he thinks that it's inappropriate to have nuclear power plants operating so close to the New York metropolitan area. That's not a regulatory thing, that's something that comes from the political level.

THE CHAIRMAN: Absolutely.

DR. EDWARDS: And this is -- this is what I'm really talking about. I'm saying that there a lot of policy matters which are in effect being made by the CNSC without an elected mandate because they're deciding what level of risk Canadians should be willing to accept with regard to positive void coefficient and so on.

THE CHAIRMAN: Dr. McDill?

DR. EDWARDS: Thank you very much for your

THE CHAIRMAN: Don't away, you're going to have the last word but somebody wanted to ask a question.

MEMBER MCDILL: Dr. Edwards, one thing that we can do and that we have done is in the reasons for decision is to make it clear what the opinion of the

population that we have spoken to or have spoken to us, that is often sent out through the reasons for decision.

THE CHAIRMAN: And you -- some of the argument that's put in there will be mentioned in proceedings and decisions.

So okay, now you have the last word.

DR. EDWARDS: Well again, I would like to congratulate the CNSC for performing a very valuable service in terms of making these hearings available, making the records -- putting information on the internet; opening up these discussions in such a way that they become understandable to more people. And I encourage you to continue in that vein.

I do find that there is a real perception problem that when people look at these proceedings they see, rightly or wrongly, they see the staff and the Proponent as being virtually indistinguishable; that they give the same answers. They don't seem to be two different parties but rather one party shoulder-to-shoulder saying the same thing.

And I think this is a perceptual problem which is going to seriously impede the credibility of the functioning of the Commission in the public's eyes.

THE CHAIRMAN: Okay, thank you. Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

DR. EDWARDS: Thank you.

THE CHAIRMAN: Mark?

MR. LEBLANC: Yes, I just want to make some verifications; we have Ms. Cockburn that is here patiently waiting in the front, but we -- in the schedule we were trying to reach Mr. Leonardi of the Toledo Safe Energy, and I don't know if he's on line, we've had difficulty in trying to make the communications.

Are you there, Mr. Leonardi?

It seems like not, so we will proceed, Mr. President, with the next submission.

THE CHAIRMAN: Okay. The next submission is an oral presentation from Ms. Cockburn, as outline in CMD H-13.185.

Please proceed. Pronounced Coburn; sorry about that.

12-H13.185

Oral presentation by

Gail Cockburn

MS. COCKBURN: That's okay.

Good morning. My name is Gail Cockburn.

We all live in a post-Fukushima world now. We must learn the lessons from the Fukushima catastrophe

to protect the health and safety of Durham residents, detailed emergency planning -- not close enough? Oh, okay, sorry I'll start again. Is it on? Okay. I'll start again.

Good morning. My name is Gail Cockburn.

We all live in a post-Fukushima world now. We must learn the lessons from the Fukushima catastrophe. To protect the health and safety of Durham residents, detailed emergency planning must be in place for a large-scale accident.

Independent reviews of the Fukushima disaster found the consequences of not taking catastrophic actions seriously -- accidents seriously, in particular the lack of emergency planning exacerbated the tragedy.

Institutional failure: A failure of human institutions led to the Fukushima disaster. A report from Japan's legislative body states that the Fukushima catastrophe was a man-made disaster brought about by collusion between the government and industry, fuelled by inappropriate attitudes of complacency leading to lack of planning, lack of prevention, lack of mitigation, inadequate evacuation plans, and inattention to long-term public health issues.

Last year the Joint Review Panel made many recommendations. Recommendation Number 63 said that:

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

End of quote.

This is a requirement to assess a severe accident where there are multi-units at the site, and when containment has been breached and radiation levels beyond the -- radiation travels beyond the plant boundary.

The CNSC said no to this request.

Unfortunately, that denial means that this request is not part of this environmental assessment. This is exactly the time and the place to be assessing a severe accident scenario and a proper emergency planning.

Emergency Measures Ontario asked the CNSC to include large-scale accidents in this EA. Their request stated:

"In order to better evaluate the impact of the proposal we request that the accident scenarios considered by this EA be expanded to better reflect the range of possible protective

measures under the provincial nuclear emergency response plan. This will also help ensure consistency with the lessons learned from the Fukushima event, as stipulated in the CNSC's Fukushima Task Force Report."

The CNSC has refused EMO's request. Again, this is another unfortunate denial and loses the opportunity to improve protective measures for a severe accident.

Many interventions by individuals and local groups have made the same request, that severe accidents be included in this EA. This has been refused.

So here we have our regulator, the CNSC, that denies the request from a federal government body, the Joint Review Panel; that denies a request from a provincial body, Emergency Measures Ontario, and denies the request from local residents of the community to include severe accidents in this EA.

What we are requesting is that the licence to rebuild be denied until emergency planning after a full Panel review is in place for a severe accident.

At a recent Durham Nuclear Health Committee meeting, the main topic of discussion was lessons learned from Fukushima. Philip Webster of the CNSC and Mark

Elliott of OPG gave progress reports on the work of their -- on the work their organizations are carrying out post-Fukushima. Shawn-Patrick Stensil of Greenpeace also spoke about lessons from Fukushima, focusing on institutional failure.

During discussions, Mark Elliott acknowledged institutional failure as a cause of Fukushima. That institutional failure is a contributor to risk in the Darlington EA has not been acknowledged by OPG and CNSC. The CNSC has refused to include the effect of institutional failure as a contributor to the risk in this EA.

Institutional failure is a lesson we must learn from and apply at this EA. This is a perfect opportunity to learn from the mistakes of others and take precautions to prevent another Fukushima.

During that recent Durham Nuclear Health Committee meeting Philip Webster of the CNSC mentioned that radiation monitors were located every three degrees at Darlington. The data from these monitors should be available to the public in real-time.

One of the lessons from Fukushima was that citizens were needlessly exposed to radiation fallout because authorities were unable to correctly monitor, predict, and communicate the path of radiation fallout to

their citizens.

Last year, in September, data on the half hourly releases of radioactive noble gases from a nuclear power plant were made public. This was the first time, anywhere in the world, time data became publicly available for study.

During refuelling the concentration of noble gas emissions was 500 times greater than normal than during normal reactor operation. It was estimated that about two-thirds of nuclear power plants annual emissions occur during refuelling.

In order to refuel reactor pressure vessels must be opened up. This releases large volumes of radioactive gases and vapours to the local environment. Until now, nuclide amounts have been published as annual averages throughout the world. Now, non-average values are available for scientific evaluation.

These spikes in radiation could explain the increased incidents of childhood leukaemia's near nuclear power plants. The International Physicians for Prevention of Nuclear War warns of probable health impacts of such large emissions spikes. To quote them:

"Especially at risk are unborn children. When reactors are open and releasing gases, pregnant women can

incorporate much higher concentrations of radionuclides than at other times mainly via respiration. Radioactive isotopes inhaled by the mother can reach the unborn child by the blood and placenta, with the result that the foetus is contaminated by radioactive isotopes. This contamination could affect blood forming cells in the bone marrow later resulting in leukaemia."

This provides a plausible explanation for the findings of the KiKK Study published in 2007, that children under five living near nuclear power plants are considerably more at risk of cancer, particularly leukaemia than children living further away. This is astounding and troubling information.

How are you, the OPG and CNSC, going to protect pregnant women and young children when there are spikes of radiation during refurbishment and refuelling?

So what would be best is that we learn from Fukushima to not make the same mistakes that are a result of institutional failure, and to plan adequately for a severe accident at Darlington prior to refurbishment and continued operation.

THE CHAIRMAN: Thank you.

Anybody, any questions?

Dr. McDill?

MEMBER McDILL: Thank you.

Has the intervenor been here several days,
just today?

MS. COCKBURN: (Off mic)

MEMBER McDILL: Did you ---

THE CHAIRMAN: Can you push your button,
please.

MS. COCKBURN: Sorry.

MEMBER McDILL: Did you hear the -- I
believe the spike you're referring to was from a German --
-

MS. COCKBURN: This is from south -- no, I
didn't hear that -- actually, I didn't hear the
intervention.

This study I'm talking about was in
Germany, it was in Bavaria, and it was after the Greens
became part of the government. It was a government that
shared -- it was another group that they combined with.
They shared the government, and they required the
regulator to give them the timed radiation doses.

MEMBER McDILL: We did actually, I think,
see that yesterday, and I will ask OPG ---

MS. COCKBURN: Sorry, I didn't hear it.

MEMBER McDILL: No, no, that's -- that's why I'm asking if you were here, because we'll repeat -- or I'll ask to have the explanation repeated between the differences between fuelling in the CANDU's and fuelling in the light water reactors, and this particular spike, we've heard this several times and I think it's important that those who were concerned by it have an explanation of it so that --

MR. TREMBLAY: Pierre Tremblay for the record, maybe I'll ask Brian Duncan to talk our site vice president to talk a little bit about the on-going operations but fundamentally there's a significant technological differences between the Candu and the -- and the light water reactors in that the shielding operations, if you will, are a daily occurrence, but maybe I'll let Brian elaborate a bit on that. Brian?

MR. DUNCAN: Thanks Pierre, for the record, Brian Duncan. Fundamentally, that's correct. Unlike the pressurized water reactors or other style reactors used around the world, Candu reactors like mine, we fuel every single day. Every single unit gets fuelled. We'll do roughly four channels a day and we do not see spikes associated with that fuelling process. In fact, we monitor 7/24 all of our emissions and there is no -- no difference between operating a Candu study state or while

refuelling a Candu in terms of emissions from the -- from the system, from the heat transport system or from the reactor itself.

MEMBER McDILL: In terms of the -- the light water reactors, roughly what fraction of the core is -- is refuelled when a refuelling occurs and does that large -- larger fraction of the core normally exhibit a spike such as the intervenor is referring to, to which the intervenor is referring?

MR. DUNCAN: Brian Duncan for the record, there's different regimes depending on the generation and the style of those other reactors. You'll see in some instances where they'll offload the entire core to do maintenance on the reactor and in other instances where they'll change roughly a third of the core at a time. The fuel mix is different. The nature of how that fuel behaves when it's -- when it's in that shutdown stage is quite different than ours and potentially though that -- that could impact their emissions, but again, it's very different than -- than the process we see, Commissioner.

MR. TREMBLAY: Pierre Tremblay for the record, the only -- the only other thing I would add, it's just subtly perhaps, but it may be significant. The pressure boundary's never opened up. We maintain a sealed system the entire time.

THE CHAIRMAN: Okay. Thank you.

MEMBER McDILL: Can I just, sorry, Mr. President. But the readings are available in some form for the community if they wish to -- to watch or follow the emissions.

MR. TREMBLAY: Pierre Tremblay for the record, we've had a fair bit of discussion around the reporting of data, the availability of data. Obviously we monitor our emissions on a continuous basis and -- and we report in some format. So perhaps the CNSC could comment on what's available from their end as well.

DR. THOMPSON: Patsy Thompson for the record, we -- we talked earlier in the week about the -- the fact that when other studies have been done looking at cancer incidents around nuclear power plants and dose rather than distance that there's no relationship between cancer incidents in children and dose. But I'd like to say that the data that has been shown for spikes in Germany, the data does show some increases with -- with refuelling, but those spikes are still in microsieverts, like we're not seeing large releases and very high doses. They're still very well below the public dose limit and there are a small variation in background. From the -- sort of a Canadian perspective, would the -- the experience of refurbishment at Point Lepreau and Bruce, we

have on-going monitoring information for discharges to the environment and we haven't seen spikes of discharges related to -- to refurbishment activities.

So we have that experience and we know that emissions are as well controlled during refurbishment as they are during normal operations and we haven't been seeing spikes with the refurbishment experience that we have.

THE CHAIRMAN: Okay, thank you. You have the last word.

MS. COCKBURN: Yes, I guess my question is as a member of the public I would be interested in knowing what the real time data is on the releases of radiation from the plant. So who has that information? Does OPG have it? Does the CNSC have it? Do we have access to it? Is it a public -- is the public able to access it?

THE CHAIRMAN: Okay, we've mentioned this, what is emission data available to the public, where, when?

MS. SWAMI: Laurie Swami for the record, we follow the requirements for reporting to the CNSC. We make our radiological and environmental monitoring program report available online. I understand that some of the monitoring systems that Health Canada is responsible for would provide some of that data and I, perhaps the CNSC

could comment more on that as I don't have all of the information.

DR. THOMPSON: Patsy Thompson for the record, we heard from a representative from Health Canada earlier this week. They have around the station sort of a real time monitoring information and we've met with Health Canada to discuss availability of that monitoring information and I know they're working with their IT people to -- to make that data available on a more real time basis than what it is currently available. But currently it's my understanding it's reported annually or quarterly, but there is a project to make that information more readily available on a more or less real time basis because they do collect real time information.

THE CHAIRMAN: Okay, thank you. Thank you very much. I'd like to move on to the next summation by the Ontario Voice of Women for Peace as outlined in CMD 12-H13.185 and I understand Ms. Grady will make the presentation.

UNKNOWN SPEAKER: 186.

THE CHAIRMAN: 186? Is that, did I not say, okay, 186. Ms Grady, the floor is yours.

12-H13.186

Oral presentation by from

Ontario Voice of Women for Peace

MS. GRADY: Thank you, I also gave you a photograph to take a look at. I was hoping that everybody on the panel here could take a look as well.

I'll go ahead and talk while you're looking at that. So the Co-chair for the Canadian Voice of Women has also written in her submission. My submission is not in your -- in your paperwork there, but she's outlined what we're here about, what our questions are. So, briefly, the summary is, our concerns are the impact of the routine operation of the Darlington plant on Lake Ontario drinking water which is the tritium, what it is on the fish and the wildlife of the lake due to the speed and volume of freshwater being drawn into the plant and released back into the lake, the lack of safe storage for the nuclear wastes being created by the operation of a nuclear plant and the requirements for permanent storage for thousands of years and the burden that this places on future generations.

It is unacceptable to be passing this toxic legacy on to future generations. The costs of the long term care of nuclear wastes could be prohibitive to any further nuclear power development or refurbishment. If these costs -- if these costs were considered in full,

sorry about that, I'm thinking about talking a little slower, the potential for extreme harm from a nuclear accident and we have seen in the severe damaging nuclear accidents at Chernobyl and Fukushima that operation of nuclear power poses risks of extreme damage in the case of a nuclear accident.

What would be the impact of this on highly populated areas on the shores of Lake Ontario and they would also be irreversible. This risk must be considered. Research shows that 1.5 percent of all reactors meltdown. The damage from a meltdown is unacceptable and is completely unnecessary when we have alternatives.

For a concern regarding the lack of due process for the consideration of the extremely important matter of the operation of nuclear power plants in Ontario, we're particularly concerned that there's no forum for open dialogue on alternative energy paths and I know you spoke about policy not being your area, but I think that there's room for discussion there. We need this dialogue in order for society as a whole to make informed choices about energy, our energy future together because it's not us and them, it's all of us. And I want to just voice my appreciation for everybody to in the same vein that Gordon was speaking about and the previous, echo what the previous intervenor was speaking about.

It's very important that we have these open forums and I think that one of our recommendations is that you do have another forum and you do delay this process further because there are a lot of people who have yet to come forward.

Five: There are clean renewable alternatives that are readily available and make the generation of nuclear power completely unnecessary, and that's our position.

Mark Jacobson, of Stanford University, has prepared a study on the climate impact of our current sources of energy and has analysed what would be involved in a transition to meeting 80 to 90 percent of all energy needs from renewable sources. And that study is online, and I could forward that.

As well as renewable energy the potential for energy conservative is immense. Every megawatt is an immediate savings for individual citizens and a long-term benefit for society as a whole.

Our perspective is on behalf of our children and grandchildren and all of us who are living in the vicinity of the Darlington reactors. We are planning here for the long-term. We need to realize the impact and importance of our choices regarding our energy future. We need to seriously consider all the options and choose

wisely for the years ahead. Lyn Adamson, Co-Chair, Canadian Voice of Women for Peace. So that was hers.

Now, I'll just say a little bit about myself here and my submission is to follow-up with that.

Good morning, and there was one other area that I would like to address. And my hope is that we're going to shake things up. This is pretty much it for me. I'm finished with this once I've made this -- this effort. That's my feeling.

I would like to acknowledge that we're here on Algonquin land and to thank the First Peoples of this area on their forbearance in having us here.

I was going to tell you a story about the Naniboujou. He's the white rabbit for Ojibwa traditions and how he took the chemical trails. He attached uranium pellets to them, and like a bunch of balloons, strung them all together and flung them out deep into space and the stories that would come out of that description. But that's another day. And I'd like to see you visualize for a minute where you see that ending up.

So now back to the drier stuff. I'm here to speak on behalf of the Voice of Women for Peace. I am the Treasurer of the Ontario Chapter. Voice of Women was formed in 1960 in response to the threat of nuclear war and the immediate threats to health caused by atmospheric

testing of nuclear weapons.

An early action of VOW was to collect baby teeth for testing to show the effects of radiation on our children, the most vulnerable members of society. The advocacy undertaken by Voice of Women on behalf of the most vulnerable in society and on behalf of future generations was instrumental in ending atmospheric testing of nuclear weapons.

As well VOW continued to be involved in citizen diplomacy efforts aimed at ending the mutually assured destruction defence strategy of the day. As an adult and a parent today I'm grateful for their work as it directly reduced the threat to the health of our generation from strontium 90.

We need to take action and that is why Voice of Women is here today on behalf of the health of all of our families and especially those most vulnerable are children and grandchildren.

Roughly 50 years later, nuclear weapons continue to threaten civilization and until full nuclear disarmament takes place, this threat will be a burden we continue to pass onto the children growing up today.

The nuclear industry is a failed experiment. We need to acknowledge this and move on. Renewable energy has been adopted in dozens of countries

as their soon-to-be primary source of energy. Remember 80 to 90 percent is possible.

Austria was the first country to begin this phase out. This was way back in 1978, and has been followed by Sweden, Italy, Belgium, Germany, Austria and Spain. Austria and Spain have gone as far as to enact laws not to build nuclear power stations. Several other European countries have debated the phase-outs.

Following the March 2011 Fukushima nuclear disaster, Germany has permanently shut down eight of its reactors and pledged to close the rest by 2022.

It is essential that we, as citizens and you as the appointed body call for the reduction of risks of anything that threatens the health of future generations and their prospects for survival.

The technology for new energy exists. It's here. It's free. Those are things that you're all familiar with, free wind, solar, tidal, bio fuels, et cetera, et cetera.

As I researched for this presentation I was very alarmed to discover that Canada's drinking water standards allow 10 times more tritium in drinking water -- and there's numbers, that is allowed -- than that as allowed in the U.S. That's roughly one half to -- well not even that, it's a sixth. We should always be striving

for zero discharge. Always. This is critical.

While it is not my purpose to repeat the technical data, which you're receiving in a number of the submissions you're receiving today, I do wish to refer to the following information.

Food and water around Canada -- Canadian nuclear plants show elevated levels of tritium. An apple farm, at a farm near Bruce complex, tested over 900 times the normal background radiation. There are statistical credible increases in childhood leukemia deaths and Down Syndrome around the Bruce and Pickering nuclear facilities.

I was exposed to radiation in 1976. My upper back is covered in lesions. I would like to show you this picture -- that you've seen. My entire body looked like that just one year ago.

What I know for sure is that populations everywhere are being exposed to low levels of radiation on a daily basis and they don't even know. It isn't the amount of radiation, as far as I can understand it, but the time that you are exposed that creates the problems.

With that in mind and with reference to the proposed re-licensing of existing reactors and the two new builds that are proposed at Darlington nuclear facility, Ontario Voice of Women recommends that the CNSC take your

decisions, together with the Ontario government -- and I know this goes past what your mandate is however, I think that there are -- there is a lot of room here. We are a people of a society -- this is democratic society and we can't ignore the fact that democracy is in a pretty interesting state.

And we suggest that together we do some of the following: develop detailed plans for accidents involving large radiation releases including multi-unit accidents; develop detailed evacuation plans for at, a minimum, an increased perimeter of 30 kilometres around the Darlington and Pickering nuclear generating stations.

Three; engage in all -- with all the municipalities within the regions such that they become involved in the ongoing monitoring of radiation levels and are response-ready in the event of the inevitable accident, that would include adequate evacuation areas; develop concrete community preparedness and education policies and programs that can be expanded in concert with community input and provincial resources.

The effects felt on the Japanese and the Ukraine populations from the lack of these are essential lessons, and would have been preventable, learned from these two nuclear meltdowns; institute safe storage for the nuclear wastes being created by this site and the

increased burden that it will bear on the addition of two more reactors; provide realistic open and measurable plans for the disposal of existing low, mid and high level nuclear wastes. Such a plan should take into consideration areas already potentially earmarked for fracking, possible earthquake zones and as flood risk areas.

THE CHAIRMAN: Could you please wind up.

MS. GRADY: Pardon me?

THE CHAIRMAN: Could you please finish.

MS. GRADY: Higher traffic volumes and attendant risks involve a -- in transportation to these wastes is a serious concern for this community for sure.

Develop a health plan for the region, which includes nutrition programs as proactive and pre-emptive measures.

Particular attention should be given to health monitoring of older women, pregnant women and young girls and developing children for possible exposure.

These are critical because women tend to get these cancers twice as often as men. The female body behaves differently.

THE CHAIRMAN: Okay. I think we have heard enough.

MS. GRADY: Make potassium iodine available

and and monitor these programs and backup communication systems and we need higher standards for reporting and public notification. So the discourse is very lacking. I have one -- one or two comments, which I'll save ---

THE CHAIRMAN: No. No, please, that's it.

MS. GRADY: That's what I just said. I would save those.

THE CHAIRMAN: Okay, thank you.

Questions? Anybody want to raise any questions?

Monsieur Harvey.

MEMBER HARVEY: In the written document, page 2, number 3, top of the page, we can read: "Research shows that 1.5 percent of all reactors meltdown".

Could you just comment on that sentence?

THE CHAIRMAN: Instead of commenting, where did you get the statistics from? Where is the 1.5 percent ---

MS. GRADY: Well ---

THE CHAIRMAN: --- of total reactor meltdown.

MS. GRADY: --- I have to apologize. This is Lynn's submission, the piece.

THE CHAIRMAN: Right.

MS. GRADY: So I will go back to her and I'll request where she found that.

THE CHAIRMAN: Okay.

MS. GRADY: I would suspect that it was Marc Jacobsen.

THE CHAIRMAN: Okay, that's good. Thank you.

MEMBER HARVEY: You're not aware of such a statistic?

THE CHAIRMAN: Well, the intervenor will give us -- the intervenors will give us a reference and we'll follow up on that. Thank you.

Anything else? Mr. Harvey, anything else?

Okay, thank you. Thank you for your presentation.

MS. GRADY: Thank you.

THE CHAIRMAN: I -- we'll take a break for 15 minutes which will get us here to five to eleven. Thank you.

--- Upon recessing at 10:38 a.m./

L'audience est suspendue à 10h38

--- Upon resuming at 10:57 a.m./

L'audience est reprise à 10h57

THE CHAIRMAN: Okay, we are ready to proceed.

The next submission is by The Toledo Coalition for Safe Energy as outlined in CMD 12-H13.184, and I understand that Mr. Leonardo or Leonardi is coming to us via teleconference. Mr. Leonardi, can you hear us?

MR. LEONARDI: I can hear you.

THE CHAIRMAN: Please ---

MR. LEONARDI: Thank you.

THE CHAIRMAN: You have the floor, please proceed.

MR. LEONARDI: Okay, I will.

12-H13.184

**Oral Presentation by
Toledo Coalition for Safe Energy**

MR. LEONARDI: My name's Michael Leonardi. I'm calling from Toledo, Ohio, and I work with one group, that's The Toledo Coalition for Safe Energy and another called The Coalition against Nukes, which is a national organization here in the United States.

And it's come to my attention, I'm not watching the webcast, but I -- it's come to my attention that one of your commissioners, Ms. Velshi, (inaudible)

Velshi, was formerly employed by Ontario Power Generation working on a project to build new reactors at the Darlington nuclear site.

It doesn't surprise me that this is the case. I guess it's been requested that she recuse herself because this could be -- well, is perceived as a conflict of interest. Now, this doesn't surprise me because I deal with the Nuclear Regulatory Commission on a regular basis here in the United States and, you know, conflicts of interest is one of our major concerns here as well. It seems there a revolving door between the nuclear industry and the agencies charged with protecting the public from the nuclear industry.

So I would request on behalf of our constituency here in the United States that this is a pretty egregious, I've never seen such an egregious ---

THE CHAIRMAN: Excuse me.

MR. LEONARDI: --- conflict of interest.

THE CHAIRMAN: Excuse me. This item has dealt before. Please proceed to your substantive presentation.

MR. LEONARDI: Okay ---

THE CHAIRMAN: You've got ---

MR. LEONARDI: --- (inaudible)

THE CHAIRMAN: --- 10 minutes.

MR. LEONARDI: All of the -- yeah, all of the issues that I have to deal with have been dealt with before, but I will say that I believe that you should all be aware, you are aware, as people that that work to uphold this industry, that all nuclear power plants leak. It's come to -- from my research, the CANDU reactors reach -- leak more tritium than the light water reactors. I did some research around the, what is it, Bruce Power Plant and found their tritium documents. It seems like there's quite a bit of tritium that releases from the -- that plant and then gets into the milk supply through the cows that eat grass and all this other kind of thing around there. It's not a very good situation for our future. It's -- we have it on a list of few things. So all nuclear power plants leak. All nuclear power plants are producing high level radioactive waste that's going to remain dangerously toxic to the environment and human beings for hundreds of thousands of years.

This nuclear -- high level nuclear waste is piling up on the shores of our Great Lakes thanks to the continued insistence upon our governments and industries and regulatory agencies working in tandem against the public to continue, like a train, in this direction.

And I would call on behalf of the citizens of my constituency here in northwest Ohio, and in the

United States, that Canada maybe set the example here and move away from this technology that's been proven to be nothing but a disaster. It's really insane to think that we would want to continue to produce high level radioactive waste on the shores of our Great Lakes.

I don't know that Canada has a plan to deal with this high level radioactive waste, to store it and keep it safe for hundreds of thousands of years. So I would suggest that a plan or a proposal or the focus be on that instead of on continuing the production of this waste.

Billions of dollars that's going to be spent on this refurbishment, it seems like an -- a ludicrous waste of money. And I understand this jobs versus the environment argument that always comes about, but it would be nice to consider that the executives and the stock holders of Ontario Public -- Ontario Power Generation might consider investing these billions of dollars into some kind of hardened, onsite storage for this waste in the interim and investing in renewable energy jobs that can create and transition some of their plant workers into these -- into this renewable sector.

It seems like a -- I consider these sort of testimonies exercises in futility. That's what I've learned from years of doing it, whether it be with the

Nuclear Regulatory Commission or the Environmental Protection Agency here in the United States.

This is my first exercise in futility crossing the border here into Canada but I'm going to keep it really short and concise and that's all I really have to say. It's really disheartening and frustrating to see such a revolving door between the industry and your regulatory agency there. So I hope that Ms. Velshi recuses herself from these proceedings and makes it less of a mockery of democracy than it already is. Thank you and have a nice day.

THE CHAIRMAN: Thank you. Anybody want to say anything? Thank you for your presentation.

MR. LEONARDI: You're welcome.

THE CHAIRMAN: I'll like to move now -- the next submission is an oral presentation from Ms. Cumbow. I hope I pronounce it right, as outlined CMD H13.189. Please proceed.

MS. PELOSO: Actually I'm Andrea Peloso. Just want to make sure there isn't a mistake.

MR. LEBLANC: My mistake, sorry. The next presentation was Ms. Cumbow, I just missed the boat. Ms. Cumbow has asked that we take her oral presentation and make it a written submission. So we can go to your presentation Ms. Peloso. I had Louise just freaking to be

honest.

THE CHAIRMAN: Okay, so let me start again. Our next submission is an oral presentation from Ms. Peloso as outlined in CMD 13.57. Please proceed.

12-H13.57

Oral presentation by

Andrea Peloso

MS. PELOSO: Thank you. So this is my first presentation to the Canadian Nuclear Safety Commission. So please forgive me if I break any rules. My name is Andrea Peloso and I'm a yoga instructor in the Toronto area, as well an instructor in Environmental Studies and Women's Studies at George Brown College.

I'm also someone who loves to use trails in the east end of Toronto, as well as teach workshops in areas such as Lindsay, which are close to Darlington. I've also written a number of newspaper articles on fridges and energy conversation.

The Darlington Nuclear Station's continued operation poses risk to my health, as well as that of my neighbors and students in Toronto. I'm especially concerned about the Darlington Station following the Fukushima disaster.

I have lived in Japan prior to Fukushima and have been in contact with former students and also Japanese people here in Toronto who are connected with folks in Japan.

When I lived in Japan, I was so impressed with how precious farmland is and the lengths that people go to protect the farmland and also to the land of Japan of earthquakes.

And I actually brought a map which is not of Japan. It's an 1829 panorama of Salzburg, Austria which is also really close to the southern German border, which I'm going to hold up and show to you now.

So this pretty much still looks almost exactly the same in how it did over a hundred years ago -- more than a hundred years ago. And in countries like Germany and Japan where there's a greater population and less land, people are so conscious of how precious land is. You really -- you see the beauty, you see the reverence that people have for the farmland and the awareness that that farmland. And that land is a source of health.

So I think that the fact that Japan already has had more impetus than we have to protect the land shows that, in a way, they were in a better position to protecting the land than we are and still look what's

happened with Fukushima.

Countries like Germany that have very similar land use and even -- you could see in Germany the images of cherry blossoms in the newspaper that were so similar to the same trees in Japan, that people have a very visceral immediate response saying, we know this could happen here and we want to protect the land.

So I just wanted to start by saying how precious our land is here as well and that we can't part with any of it and can't part with the safety and the illness that can be caused from any kind of disaster.

So this is why I'm here today. I cannot agree with the conclusions of the Canadian Nuclear Safety's Commission Environmental Review of the Darlington Nuclear Station reactors.

Ontario Power Generation is proposing to extend the operation of Darlington until 2055. This with come with it the risks of an accident like Fukushima, the type of accident my friends and students are going to live with for the rest of their lives, an accident that could release radiation and forever change the Toronto area.

This is principally why I respectfully ask you to not approve this Environmental Assessment today. I have three main reasons why I don't think you should approve this environmental review. Those being, first:

the accident risks at Darlington. Second: Darlington's impact on Lake Ontario and third; the lack of assessment of less risky alternatives to Darlington.

I believe that before you approve this project, you have a responsibility to first fully provide the public with information on the accidents.

So first, I don't think the CNSC has properly portrayed the risk of a major reactor accident at Darlington. As I mentioned, I've witnessed second hand, through my friends and students, the impact of a nuclear accident and what that can have on the environment and a society. I don't see that the CNSC's Environmental Assessment reflects this reality. There is no discussion of reactor accidents involving major radiation releases.

The existence of the Nuclear Liability Act tells me that Ontario Power Generation also believes an accident at Darlington is possible. Accident risks are also set to get worse. As Hurricane Sandy reminds us, erratic and extreme weather events will increase accident risks at Darlington, as global warming increases.

The CNSC's Environmental Assessment however, doesn't discuss the impact of a major accidental radioactive release on human health or the environment. I don't believe this is defensible after Fukushima. I ask you to acknowledge the post Fukushima reality.

I note that the Joint Review Panel has considered new reactors at Darlington, recommended that prior to construction of new reactors, there be an evaluation of the cumulative effects of a common cause severe accident involving all of the nuclear reactors in the site study to determine if further emergency planning measures are required. I understand this is as meaning evaluated whether emergency plans can cope with larger radiation doses.

This environmental recommendation should be heated. I also think this should be done -- I also think this should be done as an environmental assessment.

My second major concern is the protection of Lake Ontario. And I won't say much here other than that the Darlington reactors are interfering with the protection of aquatic life, with water quality of Lake Ontario, and I believe this should be stopped, especially as we become more aware of how important our local ecosystems are for food security.

Finally, I'm concerned that there has been no analysis of alternatives to Darlington. I know that you say that energy choices are not part of the CNSC's jurisdiction, but I think this lack of alternatives analysis underlies why the CNSC must do a more honest and objective analysis of the risks of Darlington.

The argument in favour of nuclear power often claims that Ontario is short of electricity and needs to keep using the amount of energy that we are today.

In reality, it is obvious, to even the most uninformed citizen, that Ontario has a major problem with energy conservation. Ontarians use 50 percent more energy than New Yorkers, for instance. And it is clear that much of that is phantom power, needless waste, and a lack of efficiency.

One glaring example of this outside of heating inefficiencies is refrigeration. Refrigerators are still behemoth instruments in our homes, consuming an average of 25 percent of all household electricity.

Despite improvements in efficiencies, they remain the size of what they were in the fifties, designed for households with larger families, two parent families and multiple residents. Furthermore, not everything put into a refrigerator needs to be there, such as fruit. in the winter.

Today, more and more people live either alone or with much smaller families. We do not need such huge electricity using machines.

In Europe, it is common for many people to share a compact fridge that is almost one-third the size

of our refrigerators here. I personally use a medical fridge -- a fridge designed to hold more than 18 cans of pop and it is more than I need. Others use an open top freezer which consumes only 10 percent of what normal fridges do and can be set above zero to serve as a fridge. This is just one example of the many unexplored frontiers of new efficiencies, electricity saving, and money saving for Ontarians.

If CNSC doesn't consider energy policy, what then does it have to do with this environmental assessment?

A discussion about alternatives is also about the risks of various energy sources. As I've mentioned, your environmental assessment does not provide a realistic portrayal of the risks of operating Darlington until 2055. This distorts the public debate and dialogue amongst Ontarians and our political leaders.

In conclusion, I would like to thank you for your consideration and ask you not to approve this project.

Given what I know of the risks of nuclear power from my friends and students in Japan, I would ask that you upgrade this review to a full Panel review. I think their public needs to be informed -- provided information on the complete risk of Darlington's

operation, not simply claims from OPG that the reactor's safety systems are safe.

I also think you should protect Lake Ontario. On this front, I fully support the submissions made by Lake Ontario Waterkeeper and their experts.

And finally, we need to consider alternatives to Darlington. I want you to at least acknowledge this in your decision on this project. A referral to a Panel review, as I understand, would also provide more latitude to consider alternatives to Darlington, and this should be pursued.

Thank you very much and ---

THE CHAIRMAN: Okay.

MS. PELOSO: --- I'll send you this picture.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Okay. Questions? Anybody? Monsieur Harvey?

MEMBER HARVEY: Well, maybe I would like OPG comments on the -- on page 1 of the -- Ms. Peloso's submission. In that paragraph, OPG has specifically asked for legislation so that it will not have to compensate victims in the case of a large-scale accident.

MR. TREMBLAY: Pierre Tremblay, for the record.

I'm not sure if this is a reference to the *Nuclear Liability Act*, but I think that that subject's been discussed thoroughly ---

MEMBER HARVEY: I know -- I know -- just because it was there.

MR. TREMBLAY: No, it would be the answer -- I'd -- I'm not aware of that.

MEMBER HARVEY: We got the answer.

THE CHAIRMAN: Okay, thank you. Thank you for your submission.

MS. PELOSO: Thank you.

MR. LEBLANC: The next scheduled submission is a submission from the Physicians and Scientists for a Healthy World; they're not available to make their oral presentation and have asked us to treat it as a written submission.

So Mr. President, if you want to introduce the next submission.

THE CHAIRMAN: The next submission is from the Physician -- oops, I just read what I'm told.

The next submission is an oral presentation from Ms. Sinayuk -- I don't know if I'm pronouncing it -- Sinayuk, as outlined in CMD H13.179 and 13.179A.

Please proceed.

12-H13.179 / 13.179A

Oral presentation by

Sandra Sinayuk

MS. SINAYUK: Good morning. My name is Sandra and I'm 17 years old. I'm here today on behalf of my Environment Club at Thornhill Secondary School which is located just north of Toronto.

And my other club members couldn't be here today because of the teachers' strike. But I'm here to oppose the refurbishment of Darlington reactors.

As both a member of the younger generation and as someone whose family has been affected by past nuclear accident in Chernobyl, I'm extremely uncomfortable with your proposed project and I would like to ask you to not rebuild Darlington. And I'm asking you for this based on environmental health risks, as well as reactor design flaws and human health risks.

So a big reason why I oppose Darlington is the threat to environmental health, so in this case it's Lake Ontario's aquatic ecosystems.

And one of the problems with that is the screens and the fact that smaller organisms and smaller fish are caught in the screens and are killed, as well as the chemical and thermal pollution that occurs.

So, like, when the small aquatic organisms are exposed to biocides and thermal pollution, also when -- because the Darlington reactors, they don't have cooling towers and the U.S. actually does try to make sure that reactors have cooling towers so that the thermal pollution is reduced.

But the Darlington reactors are not -- they don't have the cooling towers. And so it concerns me that there are fish that are being killed and their behaviour patterns are changed and their reproductive success is affected.

And there's so many people that use Lake Ontario as a food and water source, and so it not only affects the food supply and water cleanliness, but also it goes against the *Fisheries Act*.

So my environment club would like to ask you that if you do choose to approve the project, that you have cooling towers installed to accompany the reactors.

So the biggest reason why I oppose the reactors is because of the design and so other CANDU reactors use positive reactivity which removes Chernobyl reactors and this makes me extremely uncomfortable because other countries try not to have positive reactivity, they try not to copy Chernobyl.

And also the shared safety system and with

that -- all we know that Fukushima had separate safety systems and still one reactor -- there was a chain reaction that caused other reactors to be affected as well with Fukushima. And with the CANDU reactors there would be a shared safety system which would make something like that much more likely to happen. And that makes me really uncomfortable. And it seems very logical to me.

As well, the nuclear industry says that the reactors are safe and that an accident isn't going to happen. However, we see that about once a generation there is a nuclear accident, so my Environment Club would like to ask you to have an environmental report that considers large accidental releases.

Now, being the child of Ukrainian-born parents, I've personally experienced post-Chernobyl effects through the deaths of several of my relatives. And one of them was my maternal grandmother who is -- you can see in the pictures. And she was a mathematics teacher in (inaudible), Oblast, and she died of cancer at the age of 63 and she got diagnosed with cancer right after Chernobyl happened. And, basically, she was said to be very energetic and strong and healthy and she was rarely sick. And another relative was my great-aunt from my father's side and she was -- she lived in Kiev. And she was also said to be energetic and healthy and she

still got diagnosed with cancer after Chernobyl and she died at the age of 52.

And after seeing all of these similarities between Chernobyl and CANDU reactors, I'm really worried about Canada's future and I'm really uncomfortable with the idea of a nuclear accident happening 75 kilometres from where I live.

And it's also because of the nature radiation being biocumulative and affecting a large span of generations. So my parents were exposed to Chernobyl and I don't yet know how the radiation could have affected them or how it might affect them in the future. And myself being born nine years after the accident, I don't yet know how I could be affect -- possibly affected by the radiation.

So because I have been exposed to the media coverage of the accident in Fukushima and because I've heard a lot from my parents about Chernobyl, I'm really uncomfortable and worried about Canada's future. And I don't believe that it would be wise to rebuild the reactors because of the human and environmental health risks. So I also don't want to -- I don't wish for other families to experience the grief that my family and other families that have survived Fukushima and Chernobyl have experienced.

And as a member of Canada's youth, I would like to stand up for my generation and I would like to ask you, on behalf of my school's eco team, for three things. The first is for you not to approve the project. The second is for you to have an environmental review that considers large scale radiation releases. And the third is to consider green alternatives to Darlington.

Thank you.

THE CHAIRMAN: Thank you. Anybody?

Dr. Barriault.

MEMBER BARRIAULT: Firstly, thank you for your presentation.

I'd like to ask CNSC if they could just briefly explain the difference between the Chernobyl reactor and the CANDU reactors.

MR. COUTURE: Michel Couture, Director of Physics and Fuel Division, for the record.

The main differences for the -- well, there's many design differences in the -- between the two, but I would like to emphasize the fact that for the CANDU reactor, we do have two independent equally effective shutdown systems, whereas Chernobyl had one shutdown system, much slower. The CANDU reactor can actually -- the shutdown system is about two seconds -- within two seconds you shut down the reactor. For the Chernobyl, it

was the order of 18 seconds.

There's -- and also there were design flaws in the shutdown system. In fact, when the shutdown system was activated, it increased the reactivity. So -- and there were various violations of the procedures. The Chernobyl reactor, if you consider the speed at which the reaction occurred, or the power surge, if you consider, for all things equal, the Chernobyl -- the power surge is much, much faster than a CANDU reactor.

So these are the -- some of the key -- oh yes. I'm being given also the fact that there was no containment for the Chernobyl reactor as opposed to the containment we have for a CANDU.

MEMBER BARRIAULT: Thank you. Next questions will be to OPG, and this is a recurrent theme, and I know we talked about it yesterday, the shared safety system between the different reactors.

MR. TREMBLAY: Pierre Tremblay, for the record. I'll just have Mark Elliott elaborate again on this subject.

THE CHAIRMAN: Very -- very quickly. We discussed this many, many times.

MR. ELLIOTT: Mark Elliott, for the record.

I think the key question is not whether the systems are shared, it's whether the systems are -- have

the capability to handle the accidents that could happen on one reactor and on multiple reactors. And our systems at Darlington have that capability to respond to single unit and multiple unit accidents.

THE CHAIRMAN: Okay.

MR. TREMBLAY: Does that answer your question?

THE CHAIRMAN: Before you do, I going to have the question. You're going to have the last word. I'm going to ask you a question a bit sensitive.

Obviously your family went through a lot of time -- a lot of hard times with respect to nuclear. Are they -- and I'm assume they still have some family relationship back in Ukraine. Are you aware that the Ukraine government is considering building another nuclear power plant, and is your family sort of, actively involved in any way? You don't have to answer if you don't want to, I'm just curious.

MS. SINAYUK: I actually don't really have any family living there anymore. But also I have a question for whoever. But if -- 'cause I know that with other countries, they don't -- they try not to have -- like, for separate safety systems, they don't really have shared safety systems. So why is it that you want the CANDU reactors to have the shared safety system, but --

which contrasts to other countries?

THE CHAIRMAN: It's only an additional safety feature over and above the independent safety feature that each has. This is my understanding, somebody can correct me if I'm wrong. That's the way it was explained to us yesterday when we discussed it. I don't know if you had a chance to listen in, but that's what -- maybe you should repeat again very quickly.

MR. JAMMAL: Ramzi Jammal, for the record.

It's the -- each reactor -- I'm trying to give you an analogy. I mean, hopefully we're able to communicate to you so that you're able to translate what we're trying to do from technical term to what it means. So each reactor is capable of shutting down safely as an individual reactor. And then in addition to this, each reactor that can shut down safely on their own, there are redundancies, so there are other layers of defence. And one of them is, if required, is a shared system in order to add another layer of defence. So if -- I mean, I'm trying to give you an analogy not to -- I know our -- my specialist is going to kill me what I'm trying to say, so -- but I'm going to say it anyways.

So think of a car, okay? So you've got the brakes of the car, you've got -- and then you've got an emergency brake. What you're applying all the time is

this brake that you're applying and in a case of emergency, you have an added redundancy that you are able to maintain, slow the speed and control to its full stop safely. And that's what we're trying to explain redundancy in the system. It's not just one unit; it's multiple units and multiple layers of safety levels.

THE CHAIRMAN: You have the last word.

MS. SINAYUK: Yeah. I am still, like, wondering about the whole thing with if you don't consider large releases in your environmental review, then how do you know that you're going to be prepared for something that has -- like an accident that has a large radiation release?

THE CHAIRMAN: It's again, you -- I don't know if you had a chance to listen yesterday late to the Greenpeace presentation. You didn't?

Okay, well, we discussed this for at least an hour, an hour and a half so I don't want to really repeat this, but if there's maybe a one-minute reply from both sides, try to -- try to inform the intervenor because this, you know, this is something that we'll have to take under advisement.

Go ahead.

DR. THOMPSON: Patsy Thompson for the record, just simply the -- the environmental assessment is

just one component of the work that the CNSC does. So in the environmental assessment, we took into consideration the very major type of accident and looked at, with the safety systems, like the filters that are in place, what the consequences on the environment would be and -- and look at the emergency response in terms of -- of how that would help in terms of dealing with the accident.

Once the EA is done the other types of accidents are considered when we go for licensing and there's a full emergency measure response plan in place to deal with the other types of accidents that are dealt with under licensing and that's another type of review that is done by the CNSC and that is required of the licensee.

THE CHAIRMAN: Okay, thank you.

MS. SINAYUK: Sorry, could I also ask what you, can you clarify to what I said about the cooling towers, so is it possible to hear that?

THE CHAIRMAN: Again it was discussed extensively and we've taken all this information and we will have to make a decision on this. The -- many many of the intervenors discussed it in day 1 and day 2 and by the way as an aside, you will be able to see this proceeding on our website, the whole thing, you can fast forward through the boring parts, but it's all there. You can see whatever you want to see, the discussion have occurred and

the cooling tower was extensively discussed. So ---

MEMBER McDILL: Mr. President, you're not going to like me when I say this but I think there are new intervenors in the room and I think maybe we could take one more look at ---

THE CHAIRMAN: Yeah, but I don't want to repeat the same argument one more time for and against. So, okay, so I always defer to my commissioner, a quick, please, reply to the cooling tower issue.

DR. THOMPSON: Mr Binder, if I could, I'll ask Don Wismer to speak quickly of the -- the requirements that are in place in very general terms and it's not such black and white but I'll ask Don to quickly in the summary.

MR. WISMER: Don Wismer, Environmental Risk Assessment Specialist, I want to talk about two things. One, President Binder wondered what lessons we could learn from the Bruce A refurb and it's relevant to this and then the other is what the requirement is on the New York side for fish protection. On the first one, we take a risk-informed approach in the federal government and for the both Bruce and Darlington, they have existing mitigation with deep offshore intakes that have reduced the number of fish killed already. And what we do is, in our regulatory process, is we reduce that further with mitigation that's

appropriate to the level of risk. There is no risk to the population level but there are individual fish killed, so we get the licensee to make further improvements and then we have an on-going follow up program to continually check the effectiveness of this and if it's not good enough or the ecosystem changes such that it looks like there might be a potential population risk, then there are other options that can be brought into play.

And we also at both sites involve other government departments, DFO, Environment Canada, the Ministry of Natural Resources and community stakeholders in reviewing the data and giving us advice on the best path forward.

So that's the first thing, the second thing, in the U.S. on the New York side, their -- their existing rule is to require performance equivalent to towers. That doesn't mean towers. It just means the level of fish killed should be comparable to towers, but it's a two-step process and the second part after determining the technology to reduce the fish kill, is to look at the other impacts. And at the end I have their policy right here, and at the end of it it says there are factors to take into account for towers. They aren't a panacea and they list five factors here that's not an exhaustive list, but it includes visual impacts, noise

issues, fogging, icing, salt deposition, air quality. The point is towers do reduce the fish kill but they also have other issues associated with them and that's the case with any of these technologies. So you have to look at the advantages, disadvantages and then make the appropriate decision proportional to the risk.

THE CHAIRPERSON: Okay, thank you. Thank you for your presentation. I'd like to move on to the next summation which is a submission by CCNB Action as outlined in CMD H13.205 and 13.205A and I understand that Ms. Murphy will make and Mr. Rouse will make the presentation via teleconference. Please proceed.

11-H13.205 / 12-H13.205A

Written submission from

CCNB Action

MS. MURPHY: Yes, hello. Can you hear me?

THE CHAIRPERSON: Yes, we can.

MS. MURPHY: Okay, hello Mr. President and Commissionaires of the Canadian Nuclear Safety Commission, fellow interveners, ladies and gentlemen; This week, we, the interveners, pro and con the Licensing, refurbishment and continued operation and waste associated with the Darlington Nuclear power plant are attending this

Commission meeting to discuss the concerns, hopes and facts that relate to Darlington.

Our citizen based action group, CCNB Action, has recently been extremely concerned that the problems that led up to the on-going disaster in Japan are reflected in our own nuclear industry and local nuclear power plant Point Lepreau. In fact, we found so many unexpected similarities that we do not sleep well at night fearing a "made in Canada", Fukushima. We have found ourselves repeatedly at odds with the decisions of the Canadian Nuclear Safety Commission. It is from this position of bewilderment at what we have discovered and the little concern or due diligence being paid to our science and experts opinion, we attend this hearing.

The 7 requests for rulings we are making are a result of our recent experience with Point Lepreau, and the lessons we have learned in dealing with the Canadian nuclear establishment. Our reasons are all based on actual findings which have to date not been adequately addressed.

CCNB Action requests a ruling from the commission that the next public hearing for the renewal of Darlington's Power Reactor Operating License be a two day type hearing instead of a one day type hearing.

The more in depth 2 day type hearings

are fairer for the public as we are given more time to review all the proponents' documents before we put our own submissions together. In a case like this hearing, we would have expected that an environmental assessment, the request for renewal of a waste facility license and a request for renewal of a Power Reactor Operator License would have warranted a day 2 type hearing. In reading CNSC documents it states that "Major Decisions" are handled in a 2 day type hearing. Is this not a Major Decision Commissionaires?

We at CCNB Action request a ruling from the commission that they require all of the PSA's, their methodologies, and screening criteria for Darlington be independently peer reviewed during the next licensing period, and that the peer review be made public.

We have asked for this peer review mechanism repeatedly since reviewing Point Lepreau's safety case and discovering multiple errors. We are left with a grave concern that if we found multiple errors in their studies that the CNSC staff have reviewed and accepted, there are more than likely errors in other nuclear industry documents -- documents which are used to decide the fate of the country's population. Our own organisation regularly undertakes studies. It is the norm, for the government to even accept our findings, that

we have our work peer reviewed. Peer reviews are not new and actually a major piece of the IAEA's Fukushima Action Plan. In the May public meeting you asked for a comparison to what other countries are doing. One difference is that in the EU stress tests the operators stress tests were independently peer reviewed. This is not the case in Canada. We count on a second opinion when there are serious decisions to be made. This is a request that shouldn't be necessary. As it stands, we appeal to the commission's sense of precaution. We request that you, Michael Binder, that you, Robert Barriault from New Brunswick, that you, André Harvey, and you, Moyra McDill, and you, Dan from Quebec, and you Rumina Velshi, we request that you all, as individuals of conscience, respect the words and dignity of other Dan's, Moyra's and Michael's to decide that peer review is indeed an important part of never compromising safety is not a huge leap of reason.

Surely, the cost of peer reviewing these most important studies would be a small portion of the huge pit of taxpayer dollars currently used to keep the nuclear industry afloat in Canada.

In the IAEA IRRS mission last year they suggested that Canada's emergency planning be independently peer reviewed. Why hasn't this suggestion

been taken from the international community?

We have been watching all week much discussion of what accidents should be included in the environmental assessment, and the staff have repeatedly been saying that they are following IAEA guidelines.

In the IAEA safety standard for emergency planning it states:

"Plans for emergency response shall be based on the assessment of the threats as described in Section 3, including events with potentially severe consequences."

The CNSC's attempt at independent peer review so far in the lessons learned from Fukushima has a lot to be desired. We were not allowed to meet with either the external advisory committee or the IAEA IRRS team. This is not independent peer review if not all stakeholders can express their concerns.

And might I add, that the IAEA did an IRRS mission for Japan before the accident and deemed their regulator as effective, the same as their conclusions with Canada's regulator.

We also suggest that you stop using the IAEA for peer review, as their mandate is to promote the safe and peaceful use of atomic energy. We do not want

peer review from someone promoting the use of nuclear power, safe or otherwise. What guarantees do we have that the CNSC staff has not succumbed to regulatory capture without truly independent peer review.

CCNB Action requests a ruling from the Commission that clearly defined probabilistic safety goals be mandated and that the licensee be required to be compliant with these safety goals. This should be added to the compliance verification criteria portion of Section 5.1 in Darlington's Licence Condition Handbook.

From our perspective, it looks like the industry and regulator are more concerned about promoting the idea that safety will never be compromised than telling the truth about safety to the public, which is that they don't actually have to be compliant with any safety goals. Commissionaires, you will not be limiting to a reasonable level the health and safety of people and the environment without this being added.

Instead, current licences only guide operators to compare their plants to safety goals. For Point Lepreau, our group pointed out that once their probabilistic safety analysis studies were done correctly, the plant was not meeting its safety goals.

Then, coincidentally of course, the safety goals that they might have had to meet were secretly

deleted from the licence condition handbook without the authorised staff person even bothering to follow normal reporting procedures, or at least noting it in the revision history of the document.

CCNB Action requests a ruling from the Commission that they ensure that Darlington's PSA's, the PSA methodologies, PSA screening criteria, and the CNSC staff's reviews of the PSA's be made available to the public via the licensee's public information program.

Our organization has learned in a very short time that industry documents are very difficult to review due to many of them being private. The onus lays with a small group of highly paid industry servants to accept their staff's opinion that things are fine.

This is currently -- there is currently a seismic study being done in New Brunswick as a result of our interventions that isn't going to be available for public review.

As a matter of fact, the citizens were only told that some doctor on the west coast of somewhere will be doing the study. They will not even tell us who is doing the study, and will not allow us to meet with the review committee. An executive summary will be released and maybe we'll get to see it under guard in their offices. Maybe. This is completely unacceptable and it

would be good from here on in that you demand licensees make these safety studies public.

CCNB Action requests two rulings regarding RD-310. Whether or not OPG's 10-year compliance commitment for RD-310 is acceptable, and if not, as we believe it is not, a ruling that the Darlington plant has to be compliant with RD-310 before any of the reactors return to service, post-refurbishment.

This important safety regulation was published in 2008. It is laughable that it would take 14 years to be compliant with a nuclear safety regulation. We are certainly in the business of double-speak. "In Canada, we always compromise safety" would be a more appropriate tag line.

CCNB Action requests a ruling from the Commission that an independent, open to the public, study be done to assess OPG's safety culture before the next licensing hearings in Darlington.

We have noticed, that along with all the other major nuclear accidents, that the world has known, Canadian nuclear safety culture is poor. It seems to us that if the licensee is unable to operate a plant safely, it shouldn't be allowed to do so. We don't have to look far for evidence of poor safety culture.

Allan Kupcis certainly recognized the

problem when he had an independent peer review done that shut down seven reactors and he also resigned. Linda Keen had an inkling as well but she was fired.

OPG has currently pointed to their own current poor safety culture by their comments on new safety regulations that were suggested as a result of the tragedy in Fukushima. They said that the new safety regulations were not Fukushima related, requiring further evaluation and that the proposed changes be deferred to a future revision of the document, which will probably take 14 years to be compliant with. Their comments were identical to the other licensees who submitted. Is this their attempt at regulatory capture?

CCNB Action requests a ruling from the Commission that an independent, public study be done to assess the CNSC staff's safety culture, independence and transparency before the next licencing hearing for Darlington.

Again, a major contributor to the Fukushima accident with both the regulator as well as the licensee was poor safety culture. We believe that it is therefore the Commission's responsibility, before granting a licence, to address any possible safety culture problems within the CNSC staff.

In informing their opinion, the Commission

relies heavily on the CNSC staff's recommendations. Our experience, when relating with the CNSC staff, post-Fukushima, has given us concern that there may be issues of safety culture, transparency and independence.

Despite all that we have found, we are ever hopeful that our laws and our best minds will conspire to put people, not their jobs and huge salaries, first. We speak in terms of radiation releases and percentages when we look at the risks to the public. One wonders if we spoke instead of the loss of children and parents in return for nuclear power and obscene sums of money, we might all agree that one death is too many.

Our intervention recommends ways that could make the nuclear power industry safer but never safe. The only safe and moral decision would involve the decommissioning of all of Canada's nuclear power plants immediately.

Regarding Canada's nuclear waste, again, the solution as to what ---

THE CHAIRMAN: Can you please ---

MS. MURPHY: I have ---

THE CHAIRMAN: --- complete.

MS. MURPHY: I have four more lines, sir.

--- the solution as to what to do with Canada's existing nuclear waste is to first, stop

producing it. Then we need a fair and equitable decision making process that involves a national inquiry into the future of nuclear power in Canada.

Thank you.

THE CHAIRMAN: Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Questions?

Mr. Tolgyesi?

MEMBER TOLGYESI: One. When you look in this ISO certifications and several certifications which you have, is there some which is evaluating and commenting on the safety culture of OPG and specifically Darlington?

MR. TREMBLAY: Not related to -- Pierre Tremblay, for the record.

ISO is a specific certification.

There are a number of external certifications that we hold around quality and so forth on the subject of safety culture. This is an area that's of -- a central theme for us as an organization.

Maybe I'll ask Brian Duncan a little bit about sort of the oversight, things that we do to examine the perceptions and the views of our employees to ensure that we apply all the principles of a sound safety culture. Brian?

MR. DUNCAN: Thanks, Pierre. Brian Duncan

for the record.

There's several ways that we look at the safety culture within the Darlington organization. Some of that is the -- is we look at the reporting trends, the station condition record reporting, for example, that all of our staff have access to and are able to identify any concerns. Whether it's an equipment concern, whether it's a concern with how we operate, whether it's a safety concern, all staff have access to a very simple means to percolate issues up the line to be identified and acknowledged by senior leadership so that we can take action.

But further to that, we do periodic safety culture surveys. We follow a North American standard, a process to do that survey. It's done anonymously and that allows staff to express their opinions and their thoughts on a wide variety of issues to ensure that there's not an underlying theme or that there's not -- anything that's not -- that people feel uncomfortable bringing forward that can be recognized or acted upon.

We completed a safety culture survey this year, the most recent. The results of that show that we have a very strong safety culture, and we will take action, though, on areas where we found opportunities to do even better.

Beyond that, we -- when we are independently examined by our Nuclear Safety Review Board or when outside agencies come in to examine how the station is operated and how the station performance is, one of the key aspects they look like -- they look at is organizational effectiveness, and beyond that they look at safety culture as well. And those recent evaluations have demonstrated again that we do have a strong safety culture. We're always looking for opportunities to -- how that can be improved, but fundamentally it's very sound.

MEMBER TOLGYESI: Is it, I'll label it it's public or it's just internal? I understand it's done by independent body, but I'm not sure if it's publicly available, the results of the report.

MR. DUNCAN: Brian Duncan, for the record.

No, largely it's not public, and the primary reason for that is we entrust and we guarantee our staff that when they raise concerns that they will not be identified. It's part of ensuring that they feel free to raise concerns that can be acted upon without, you know, inappropriate attention coming back on them.

So when we do surveys like that, it's done in a way to protect their points of view but at the same time understand what may be of concern to them.

MEMBER TOLGYESI: Could staff comment?

MS. HEPPELL-MASYS: Kathleen Heppell-Masys, for the record.

The CNSC, as you know, has expectations for the licensee to have a management system supporting safety culture. In Canada, we put a lot of emphasis on these key elements to ensure that safety and security permeate throughout the organization.

Now, at the CNSC, in the mid-1990s/early 2000, the CNSC has developed its own organization and management safety -- sorry, assessment method, review method, should I say, and in that regard, CNSC has evaluated 13 nuclear facilities, major facilities in Canada since then, including Darlington.

The result of this safety culture -- sorry, organization management method -- review method demonstrated that OPG or Darlington has a healthy safety culture that was present at the Darlington facility.

Now, once we've conducted those -- after we conducted these organization review method, the expectations that this was providing a baseline to each of those facilities and where they could self-assess their safety culture afterwards. Now, we have reviewed the safety culture self-assessment method used at Darlington and it is comparable to the safety culture self-assessment method that is currently presented in a discussion paper

that's available for consultation on our website.

Thank you.

MR. ROUSE: Excuse me ---

THE CHAIRMAN: You will wait until we go through a couple of more questions and then you can answer them all, please.

Any other question? Ms. Velshi?

MEMBER VELSHI: The intervenor -- this is a question for OPG. The intervenor talks about a peer review of PSAs, also talking about making them publicly available, which you have done. So can you comment on whether your PSA is peer reviewed, and if not, do you see value in doing peer review?

MR. TREMBLAY: I'm going to ask ---

THE CHAIRMAN: And maybe you should (inaudible) up to all studies that we do and staff also. I'd like to hear what our view about peer reviews. I was under the impression that everything that's being done has some peer review requirement in it. So please explain when it is, when it is not.

MR. TREMBLAY: Pierre Tremblay, for the record.

I'll ask Mark Elliott to talk about the PSA methodology. I would just offer that certainly in the nuclear industry peer reviews are an extensive part of

what we do. We do that through self-assessment of various elements of our managed systems. We do that overall in terms of our overall evaluations of plant performance against standards of excellence. It's really a fundamental part of what we do.

But in terms of the specific calculation in the work, I'll ask Mark Elliott to talk about that aspect.

MR. ELLIOTT: Mark Elliott, for the record.

On how we decide whether to do peer reviews or not, it's based on the product that you're looking at, the importance of it, the -- what sequence of reviews have been carried out as it's been produced, and also the margin. If you do a review and you're -- you've got a result that is very close to a limit, that's the time when you would request a third-party review. You want -- you've got to be right and when we're close to a limit we want to make sure that that gets done.

For the Darlington Risk Assessment, it was -- this work was led by OPG experts as a small group of them and then the work was actually done by external contractors who are, you know, eminent in their field. These are people that have done PSA work across the United States, for example, and so the peer review really was done by OPG staff reviewing the vendor product and accepting that and then the CNSC doing their own review,

which is going on now.

THE CHAIRMAN: Just clarification again. Remind me again whether I got this right, but I thought some of the PSA work is classified in terms of security. Can somebody remind me about that?

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

Certainly, given that the PSA document, some of those specifically deal into vulnerability some of which are security-related, those elements clearly are not available and not made available.

THE CHAIRMAN: Staff?

MR. JAMMAL: Ramzi Jammal, for the record.

Before I pass it on to Mr. Frappier, I'd just like to give you an overall structure on what we do from a (inaudible) perspective.

The PSA requirement is a standard under the CNSC S. 294, and the standard has gone through consultation period. It's been reviewed by the public. It's been -- as a requirement, and I'm talking about the requirement itself. And as a matter of fact, the CNSC has updated its requirement for the -- with respect to the PSAs and the multi-level of the PSA. We're one of the only very few regulators that they go to the depth of the levels that we're talking about.

I will pass it on to Mr. Frappier in order to put it in perspective. So my point here is the international community reviewed our S. 294 and we went through the consultation process publicly with respect to the requirement in S. 294.

MR. FRAPPIER: For the record, Gerry Frappier, Director General of Assessment and Analysis.

So as Mr. Jammal was just mentioning, the actual standard itself with respect to the PSA has been publicly reviewed and is considered a modern, world-class standard and approach. The first step in the approach is for the licensee to provide the methodology that they're going to review. So we do an independent review, if you like, ourselves of the details of the methodology that the licensee is going to be using and ensure that that methodology is acceptable.

We then proceed, and as was mentioned, we're -- this is continuing to on go right now. We receive all the detailed models and approach that the licensee is using and we undertake a systematic review internally within the CNSC based on both IEA review procedures or guides as well as international standards such as ASNE.

I would like to point out as well that we also get independent expert advice as needed. We've --

we've mentioned several times in here the advice we get from NRCan and the review that they do on things like seismicity.

We've also, in the context of the Darlington review, had U.S. experts on fragility calculations and whatnot, go over that aspect of the PSA, and since the intervenor is from Point Lepreau. At Lepreau, we had an external expert from the United Kingdom that came and supported us with respect to reviewing some of the fire aspects of that PSA.

So we do get independent peer reviewed of certain sections as we feel is required in our overall review.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: Thank you.

My question is on another request from the intervenor. So this is on Request Number 5, which is on compliance with RD-310. So I don't know what RD-310 is, so if you can please tell me what RD-310 is, whether OPG is in compliance or not, and if not, what are the risks associated with that, and any concerns that we as a Commission should be aware of around that, please?

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

I'll ask Dr. Rzentkowski who's the Director

General for the Power Reactor Regulation.

DR. RZENTKOWSKI: Thank you very much.

RD-310 is a document which pertains to safety analysis requirements. This document was introduced in 2008 and originally it was intended to be a companion document to RD-337, which provides the design requirements for new builds. So originally, it was intended to be applied for new builds. However, we later decided that it should have also be applied to operating facilities in a gradual fashion because we would have to revisit the safety analysis framework.

The safety analysis framework is traditionally based on single and dual failure criteria. It means a failure of a -- a single failure of the process system or a single failure of the process system combined with a failure of a safety system. So this was the way how the safety analysis was traditionally conducted for CANDU reactors.

And this kind of the safety analysis was codified in Consultative Document C-6. This document brought also some risk considerations into this framework by classifying postulated initiating events depending on the -- in the categories depending on the probabilities.

Generally, it's a very robust system of assessment of postulating initiating events, which was

very conservative and resulted in large safety margins.

The reason is that by considering dual failure criteria we brought some of the beyond design basis accidents into design basis space because, as we discussed many times in this meeting, the cut-off point for the design basis is a postulated initiating event of the probability 1 in 100,000 years. This framework we had in place, allowed us to consider some of the accidents, which are of lower probability.

Nevertheless, it wasn't -- we can say that postulated initiating events were not very systematically categorized. That's why we decided to include the RD-310 in the licensing basis of operating facilities. It allows us to look in the more systematic way at any events which may happen during normal operation, at anticipated operational transients, and also so-called design basis accidents.

However, the mapping is not 1 to 1 and it requires tremendous effort on the part of the licensees and also tremendous effort on the part of the CNSC staff to review the submissions.

For the first time, this document was introducing in the license last year. It was for the -- in the license for Point Lepreau. However, as I mentioned, it requires tremendous effort so we had to

allow for a certain time for the licensee to comply. So this work is still in progress, and I think it will conclude by the end of 2013, if I am not mistaken.

We also referenced this document in the Darlington license. Again, the objective is for the licensee to be compliant with the requirements of this document by the end of 2013.

THE CHAIRMAN: Okay, I'm not sure I caught all of this. I really didn't understand. Is the RD-310 still an existing document? If not, is the Darlington facility compliant with the safety and economic regulation?

DR. RZENTKOWSKI: RD-310 is the existing document. It's a new modern document which was issued in 2008.

Darlington is generally compliant with Consultative Document C-6, which was issued late in the eighties, and this document allows for a very conservative assessment of the safety case of Darlington reactors. We are now in the process of transferring this analysis into the requirements stated in RD-310.

THE CHAIRMAN: But is never any -- is -- are there any non-compliance with safety issues?

DR. RZENTKOWSKI: No, there's no non-compliance.

THE CHAIRMAN: That's what I'm trying to understand here.

DR. RZENTKOWSKI: That's what I mentioned. Our regulatory framework is based on single and dual failure criteria. This is a very robust approach, which allows to assess the safety case in a very comprehensive and systematic fashion.

MR. JAMMAL: It's Ramzi Jammal, for record. They are in compliance with our requirements, and they are -- otherwise, we would not be giving them recommendation for the license. So that's where we are with the requirements of the RD-310. As we put in place the enhancements, the licensee must meet those requirements.

So from safety perspective, are they safe now? Yes, they are. And then, are there enhancements to come? The answer is yes and by the ISR, once, we come before you with respect to the ISR review and the IIP. The implementation will have the detail in it what they are required to do.

THE CHAIRMAN: Other questions?

Dr. McDill?

MEMBER MCDILL: Thank you. Two questions and I'm passing these on on behalf of the intervenor. In their Section 1 request, they have asked that we ask staff

how it is determined what type of hearing is to be held. Perhaps we could have a brief review of that. Sorry.

MR. LEBLANC: I'll address this question.

MEMBER McDILL: Thank you.

MR. LEBLANC: Marc Leblanc, Commission Secretary.

I mean, the Commission is master of its own procedure. It will determine based on the various factors whether to proceed with a one-day or a two-day hearing. The EA component of the hearing screening report have always been done in a one day hearing because there's already been a lot of consultation done by staff previously.

In terms of the -- there was also the fact that we were trying to be in the community for the whole of the proceedings. So that allowed the community to not only be part of the day -- what would have been presented at the Day One proceeding, which is normally just presentations from the Proponent, and the recommendations from the staff, and then we proceed with Day Two with the intervention. In this case we thought it would preferable in the circumstances to do it all in the community at the same time.

Thank you.

THE CHAIRMAN: Marc, just a question, but

isn't Day Two really in 2014? And will there be actual refurbishment license, if it goes ahead? I consider it to be -- some would like -- anyhow, I understood what you're saying.

MEMBER MCDILL: Thank you.

Second question if it can be heard a little louder this time. In the number two request from our New Brunswick intervenors there is a comment with respect to RD-152.

I would like staff to comment on that, please. I think we had this at a previous hearing a little bit, but these intervenors were not present at that one.

MR. FRAPPIER: Gerry Frappier, Director General of Assessment and Analysis.

So I think the question revolves around RD-152 and what happened to the safety goals that were in it.

So RD-152 was a regulatory document that was put out for public consultation associated with the -- on how we go about combining deterministic safety analysis with probabilistic safety analysis. It also had within it some discussion around cost/benefit analysis and also around safety goals for operating facilities.

Based on the public comments that were

received and whatnot, it was decided that in fact that we didn't need a document exactly like that. The safety goal requirements were put into S. 294 which we've talked about several times here on the probabilistic safety assessment where there is a requirement for the licensees, as part of their methodology to specify the safety goals in which we will accept or not, and that becomes part of the licensing basis.

The other aspects of it were overtaken by the RD310 that we were just talking about, and several other regulatory documents, along with the staff review procedures that have been put in place as to how we do the combination of deterministic and safety analysis. So at this point in time there is no plan to have an RD152.

MEMBER MCDILL: Thank you.

THE CHAIRMAN: Just -- was it -- is it public -- is the intention to publicly say there's not going to be any more RD152?

MR. FRAPPIER: So I was just reminded of that.

So we did mention that with the Commission but the RD152 itself has been withdrawn from our regulatory framework plan.

THE CHAIRMAN: Formally and publicly?

MR. FRAPPIER: Formally, and I think we

make the overall plan public but I don't believe we had an actual announcement of that but I might be wrong on that.

THE CHAIRMAN: Somebody else want to add something?

MR. ELDER: Just Peter Elder, for the record.

Just to remind the Commission and the intervenor may not be aware, but at meetings of the Commission the whole regulatory plan for the next three years has been routinely presented to the Commission, and so the Commission would see and had the opportunity to ask questions about things that were on the plan that then came off.

THE CHAIRMAN: I just want to know ---

MR. ELDER: Yes.

THE CHAIRMAN: --- if that was part of this.

MR. ELDER: yes, it was.

THE CHAIRMAN: Okay, thank you.

Anybody else? Anybody? Anybody else?

Okay, the intervenors, the floors is yours; you have the last word here.

MS. MURPHY: Thanks a lot.

Just a couple of things. I was writing notes as you went through all the questions.

The withdrawing of the RD152 doesn't seem, in our perspective, to make anything safer; to the contrary, actually. And then regarding the very first answer about the surveys and the fancy paint jobs or whatever it was, that's really great but that absolutely doesn't replace regulation. It doesn't matter how many surveys you do, I don't -- I can't believe that that would be acceptable, and we really do need independent peer reviews. Your self-assessments and internal reviews are great before things are sent to independent peer reviews but you're not doing that. You know, they didn't find the mistakes that we found in the PSA's that -- when we looked at Lepreau documents and we're not rocket scientists. So, really, independent peer reviews are very, very important and internal self-assessments do not replace independents.

And then as well the plan to be compliant to RD310 and the plan for enhancements doesn't say safe to me in any way and I think it's great you guys are all planning for a lot of plans but action is really needed. And then this whole idea that they're "generally" compliant with a 1980's document is very, very unsettling.

Now, finally, we'd just like to make one more request for a ruling under the Section 23 of the Rules of Procedure and we do request that each Commissioner's decision on this Environmental Assessment

with licence power reactor operating licence and all requests for rulings be made public.

Thank you.

THE CHAIRMAN: Thank you.

The next submission is the United Church of Canada as outlined in CMD H13.206. And I understand it will be presented by Ms. Obedkoff.

MS. OBEDKOFF: That's right.

THE CHAIRMAN: I tried it. Thank you.

Please proceed.

12-H13.206

**Oral Presentation by the
United Church of Canada**

MS. OBEDKOFF: Sure, thank you. Bonjour.

We've been developing our policy for two decades now, both experienced in the field and with expert witnesses. And I'd like to summarize the ethical principles we bring to the bigger question of nuclear energy; these can be found in our two documents, 1992, "One Earth Community: Ethical Principles for Environment and Development." And then in 2000, our document, "Energy in the One Earth Community."

So just to summarize some of the ethical

principles we bring to this, is that we believe we have a responsibility, as co-creators of life, to earth and its wholeness; that we respect a just international order, which ensures the voice of the world's poor and is ecologically sound.

We promote a change of lifestyle from high material consumption which is leading to higher greenhouse gases to promote equity and sustainability.

We promote humanity's understandings of its collective responsibility for environmental damage, to protect the rights of future generations that we do not offload our debt -- our financial debt and our ecological debt -- upon them that they be left to find solutions for nuclear waste.

To not threaten the sustaining capacity of the earth; to respect and protect the biodiversity of the earth; to promote a culture of tolerance, non-violence and peace, and not to contribute to militarization nor escalation of nuclear weapons.

To ensure meaningful participation of individuals and groups in the decision-making processes.

To ensure that we base our decisions on adequate environmental, social, and cultural impact assessments, and to hold authorities and corporations responsible for their actions, domestically and

internationally, and to ensure they accept their global responsibility to prevent environmental damage.

So this framework requires that nuclear issues be viewed within the complex of problems along the whole nuclear fuel cycle.

Last time I was here to a different panel a year and a half ago, we were talking about the health effects of very small doses of ionizing radiation. The linear non-threshold model is now widely acceptable. There is no safe dose, no dose small enough to affect health. And so we don't believe we should be adding to the accumulative radiological burden.

The young woman with the Ukrainian-Canadian background talked about the Ukrainian health effects. In March I attended the release of a study at Sunnybrook Hospital and we now have a highly significant statistically significant study conducted by Maureen Hatch, Dr. Maureen Hatch of the U.S. National Cancer Institution. They've been partnering with Ukrainian and Russian doctors and scientists for 25 years. The findings include significant elevation of thyroid cancer and leukaemia in the contaminated populations at Belarus and Ukraine. And contrary to simply the death of liquidators killed by the immediate blast, there's now evidence that thousands and thousands of people have died prematurely,

and are dying.

I shudder to think what the consequences of Fukushima will be in future generations.

So there are many issues here. Another issue is the international problem of what to do with nuclear waste; we still haven't found a solution. We were talking about the Ukraine again. They've been struggling to find the \$2 billion for a new sarcophagus. What will happen 100 years from now, 200 years from now when our children's children perhaps have less public funding, perhaps they don't even know where some nuclear waste is stored. Who will deal with it safely?

The reality of nuclear events: We're now seeing a major accident every generation, and with due humility, we must accept that there's some things we simply cannot account for. I don't take issue with the high sense of responsibility that our own engineers have, and technical people have at Darlington.

I have some friends who work here who are engineers; I trust them, within the limits of their profession.

The bigger picture; God only knows. We now know that in Peace River country where they're doing fracking, which you're familiar with, they're getting tremors for the first time. Who would have thought.

We don't know what kind of geological events or human activity events 50 years from now, 100 years from now will affect highly sensitive areas.

And so with nuclear energy there's no such thing as a small accident or even a tiny risk. When it happens near a large population centre, like ours, the risk is too great to take.

We look at the risks of proliferation of military applications. We know that CANDU reactors, it's the plutonium from the spent rods -- the spent fuel that get into military applications. And I was surprised to know that Canadian CANDU reactors export tritium and the export levels that we send to the United States are far higher than the United States need for civilian nuclear power; so where does that tritium go?

We do know that the depleted uranium used for bomb, for weapons, for example, in Yugoslavia or the Middle East, they have a half-life of 4.5 billion years.

And so finally we raise the issue of the just use of resources, the ethics of a sustainable world. And now more than ever before there's an opportunity to go down a renewable -- a truly renewable energy path with wind, water and sun.

Mark -- I read your presentation by Mark Zuckerberg from Stanford University, he's done modelling

in New York State. They're very excited to see that the costs are extremely competitive now.

Even General Electric came out and said they can make more money buying and selling solar than they can nuclear energy. And that's an incredible statement.

And so instead of pouring billions and billions of dollars and subsidies into Darlington, no matter how competent our local people are, we believe that we should be going down another path now. We should be part of a transition towards truly safe green energy.

(APPLAUSE/APPLAUDISSEMENTS)

MS. OBEDKOFF: Our policy -- thank you.

Our policy has been the same since 1980; we've been calling for a Royal Commission, a national inquiry so that ordinary citizens are presented with the risks and the benefits of nuclear energy; that they have access to the scientific facts; the new findings of statistically significant studies; and the chance to share their own witness in the field, as well as be part of the ethical debate.

So, until the results of that study are available we call for a moratorium on any part of the nuclear fuel cycle; from uranium exploration to the sales of CANDU reactors, and that does include the refurbishing

and the new build at Darlington.

(APPLAUSE/APPLAUDISSEMENTS)

MS. OBEDKOFF: Small accidents and small mistakes are simply not possible near large populations and with the risks here.

I'm not an engineer but I do know there's, what, 6 kilometres of high pressuring tubing that make up the reactors here at the Darlington site. And with the best of safety inspections who can possibly know if there's a little crack in that pipe just waiting to go.

I don't understand it myself; I don't think the average citizen does. But the risk of -- even a tiny risk is too great for an area with this population density.

In Fukushima they said in the end, it was human error -- it was human error that led to the accidents, it wasn't an earthquake. Scientists have been warning since 2006. It wasn't tsunami, it was the failure of government and industry to contemplate the impossible, let alone have technical systems in place for what they already knew.

I believe that we're called to be humble and have some humility when we're dealing with nuclear energy. The risks are too great to take. The opportunities have never been greater to now embrace a

truly safe green renewable energy.

I'd like to -- I think I've got 10 minutes -- how much more time do I have?

THE CHAIRMAN: Your time is up.

MS. OBEDKOFF: My time is up, all right.

So I would invite any questions.

THE CHAIRMAN: Thank you.

Who wants to go?

Mr. Tolgyesi?

MEMBER TOLGYESI: The intervenor is stating that exported tritium is higher than U.S. military use.

MS. OBEDKOFF: No, excuse me, higher than U.S. civilian use for commercial energy.

MEMBER TOLGYESI: Okay, you said military.

MS. OBEDKOFF: Yeah, for commercial energy.

MEMBER TOLGYESI: Civilian use.

So independently on that, if it was used, that CNSC tracking exported in domestic use of nuclear products including tritium.

MR. JAMMAL: Ramzi Jammal, for the record.

The answer is yes, there are quantities that are safeguarded and we can call on -- if you don't want the precision and exactly what it is. It's a licensed activity for the exportation of tritium based on the amount that needs to be exported. So in other words,

it's safeguarded material that requires a licence from CNSC for an exportation.

MEMBER TOGYESI: The same thing for domestic production and use?

MR. JAMMAL: Of course anything -- again, there are the -- in our -- it's Ramzi Jammal, for the record.

With respect to the regulatory regime in Canada we have what we call exempt quantities for the possession and the use and this is an international standard based on international requirements. And anything above this exempt quantity is licensed by the CNSC.

THE CHAIRMAN: I think I -- I don't know why I know this but I know this so I can give you a straighter answer to this; that all nuclear material, if it goes for export, is to be under some treaty -- safeguard treaties between Canada and the end-user. And the end-user must be under a safeguard treaty for peaceful application only.

So Canada does not send any material that'll end up on any weapon, on any country.

MS. OBEDKOFF: Do I -- is it possible to respond to this?

THE CHAIRMAN: To this particular ---

MS. OBEDKOFF: Yeah.

THE CHAIRMAN: By all means.

MS. OBEDKOFF: Yes. I'm drawing my data from a recent book on uranium by Dr. Jim Harding in Regina. And he studied statistically some of the tritium gaps in the United States and despite -- despite the treaty -- and I'd have to go back to my source, but it's documented there.

Despite the treaty, he's been tracking a different use of tritium, it's simply unknown -- the levels that are used and covered by the treaty don't add up to the levels that we send.

THE CHAIRMAN: We're very familiar with Mr. Harding and his views on nuclear in general, and in -- particularly on that one.

Maybe you -- OPG will owe us some numbers on how much tritium is actually being exported. It's very, very -- my understanding it's almost negligible amount of exporting material in tritium.

MR. REINER: Ditmar Reiner, for the record.

We don't export tritium to the United States. We do sell tritium; it's sold only to the facilities that are licensed by the CNSC.

It -- the sales go into sort of three categories; it's used for research purposes, for medical diagnostics, and for firms that produce emergency exit

signs and safety lighting.

And if you look at the quantities, we extract, on an annual basis, about 1.5 kilograms of tritium from the heavy water that we process at the Darlington tritium removal facilities.

And the sales will fluctuate, but on average, we sell about 100 grams annually.

THE CHAIRMAN: All done to your questions; I just want to get some Commissioner's questions, unless you have on this particular ---

MS. OBEDKOFF: No, it's okay. No. Go ahead.

THE CHAIRMAN: Anybody else?

Dr. McDill? No.

I think the intervenor brought in a real accident -- rather than 10 to the minus 6, she talked about a crack in a pipe; that's the kind of things I understand.

So somebody explain to me -- so you have a small -- in the 6 kilometres of pipes there is a little crack in it; what happened?

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

I'm going to ask Mark Elliott, our Chief Engineer to talk about the surveillance program, high

pressure systems and so on.

MR. ELLIOTT: Mark Elliott, for the record.

We have -- we agree that there's a lot of pipe in a CANDU reactor and one of the things we have to make sure is that it's built properly first of all.

So it was built to the specifications and all the welds were inspected and were proven to be safe.

Then throughout the life of the plant we do inspections called Periodic Inspection Program, PIP. It's done to CSA standards and we inspect the most vulnerable parts, the parts that might deteriorate, and those are normally welds. And we -- if we saw anything developing on a weld we would take action, and we haven't seen that so far.

On the very small leaks that might happen on places that we haven't inspected, we have a monitoring program that looks at any leakage that would come out of the reactor and there's strict limits on that. And should we see any small leaks develop we would investigate and take action before we reach those limits.

THE CHAIRMAN: When you say see, I'm talking about is there no bells, automatic sirens, lights, things like that if something like this happens?

MR. ELLIOTT: If something more -- obviously if something more serious happened and we had a

larger leak you would get all those things happening in the control room. A small leak though is picked up -- we measure things like dew point in the reactor. We actually do a calculation everyday of how much leakage there could be. And so we're working on this daily to make sure there's no leakage.

THE CHAIRMAN: Staff, do you want to add to this?

MR. WEBSTER: Thank you. It's Phil Webster for the record.

Staff concurs with the description. The intention of the design is that the pressure tubes would leak before they would break, and this leak would be detected by the gas that flows between the pressure tube and the calandria tube; action would be taken.

Staff also concurs that during each scheduled analysis, every three years, a sample is taken of one or more of the tubes with the longest or the hardest life to verify their integrity and that they are nowhere near the point at which they may leak or break.

I would also point out that even if a tube -- a pressure tube did break without it having been detected this would be handled by the systems that are designed to accommodate that very kind of break with no impacts on the public.

THE CHAIRMAN: So a small crack will not end up in, all of a sudden, an explosion of some sort?

MR. WEBSTER: That's correct, sir.

Technically -- and my colleague is behind me here -- there's something called a critical crack length, beyond which a crack can grow quickly but below that length it will not grow quickly.

THE CHAIRMAN: Anybody else?

Okay. You now have the final words.

MS. OBEDKOFF: Why would we spend -- with due respect us stepping back from the safety factors, I still think where there's some even small -- even small possibility of risk, the consequences are too great in the case of the radiological burden that persists beyond a mere accident, the explosion if it came to that, but to health effects for generations.

But for argument's sake, why would we continue to subsidize heavily billions of dollars in nuclear build which takes a long time to come online when in fact it's very cost competitive now to go with much safer alternatives. This is the use of our economic resources and the direction we're going to go. So with all the risks, despite our best efforts at any local site like Darlington, why would we go this way?

THE CHAIRMAN: This is a policy question.

We are not ---

MS. OBEDKOFF: Well, we, we've -- pardon?

THE CHAIRMAN: We're not mandated to deal with this.

MS. OBEDKOFF: That's right. That's right.

THE CHAIRMAN: So that's -- can't give you an answer on that.

MS. OBEDKOFF: That's right. Which is why we are pressing for a full national and Royal commission so we can deal with the larger policy question and the real options available to people.

THE CHAIRMAN: Well, you can keep pressing but you're pressing the wrong body.

MS. OBEDKOFF: Well, we'd like to press wherever we can. So thank you for the presentation.

THE CHAIRMAN: Thank you very much. Thank you.

The next submission is an oral presentation from Mr. Duguay as outlined in CMD 12-H13.207 and H13.207A. Mr. Duguay, you have the floor.

12-H13.207 / 12-H13.207

Oral presentation by

Michel Duguay

MR. DUGUAY: (Technical difficulties)

documents from the CNSC. And so the case I want to make -
- well, as the Commissioners really know me very well,
we've been fighting the refurbishment of Gentilly-2 in
Quebec, and it seems like we have won that fight.

What I would like the point to make here is
the case for hardening nuclear reactors. The French have
the largest percentage of nuclear electricity in the
world, something like over 75 percent. And André-Claude
Lacoste who's the head of the French nuclear authority
claims that nuclear facilities should be bunkerized; that
the French have done experiments on the one-metre thick
containments that most reactors in the world have,
including the Canadian ones, and the French have
demonstrated that a military jet can puncture such a one-
metre concrete and expose the reactor to terrible effects.

So the French company AREVA is currently
installing containments with a total thickness of 2.6
metres of reinforced concrete in both the reactor in
Finland and the one in Flamanville in France.

Also, I'll have you notice that the New
Yorkers are quite worried about terrorist attacks. And
the new World Trade Centre going up has a new type of
concrete that's about six times stronger than the usual
concrete and it's to a thickness of two metres in the

core.

So if one wants to protect the core, the reactor from explosions, that's one reason the French -- given documentaries that were shown on television, both to contain an explosion coming from a core meltdown or from a terrorist attack or an airplane crash for whatever reason, 2.6 metres they figure is the right thing. So that's what I'll be arguing for.

Now the -- I choose to have a different opinion on the six kilometres of piping in the CANDU reactors. Last time we presented this case in front of the Commission we had this paper that was written by Frank Greening; in fact, he wrote three papers. Frank Greening is a PhD physical chemist who worked for 23 years for OPG. So he's very well known by OPG; he worked on nuclear reactors. And he explained all the problems with the six kilometres of piping.

The wall thickness in those -- in this high-pressure piping is only a quarter of an inch, about six millimetres, and there are corrosion effects that thin it down and you allow it to go down to about four millimetres thickness. That's a pretty small barrier against a 100-atmosphere pressure. Other reactors in the world have a 20-centimetres high-pressure boundary made of the best steel in the world, so you have to counter that

with a quarter of an inch high-pressure boundary in a CANDU reactor.

I have spend a lot of time in the States and my colleagues who are nuclear engineers were telling me that this was the Achilles heel of the CANDU reactor, the fact that if all those pipes -- hundreds of pipes going through the core, neutron bombardment that then brittles the pipes, corrosion effects. And the proof that these pipes are the big problem is because you want to do re-tubing; after a number of years you want to change all these tubes because you are worried about them.

So you know about the crash of the Concord in Paris on the 25th of July 2000. The important thing there is end of a safety myth. My wife and I watch every week the "Mayday" series and I would wish that all nuclear engineers at OPG and the Commissioners would watch the "Mayday" series on airplane crashes. And you find that, you know, the aviation industry is very mature and whenever something happens they want to go to the core, find what the reason was. And many times it is metal fatigue, combinations of physical failures, human error, and computers.

The last big crash, the 1st of June 2009, an Airbus over the Atlantic, it was this combination of computer systems, human error. And so you're planning to

install the new computer system and you know very well that it's hard to check software, and you never know what can happen. So you, yourself, are admitting that there's a certain probability something wrong is going to go.

Now, I want to make the comparison -- basically I want to oppose this idea. I'm sorry to contradict my colleague Vicki Obedkoff. I don't think it's a small probability. I think it's a worrisome probability that an accident can happen.

The Canadian government mandated the western Geophysical Society to study the seismic hazards for the reactors in Ontario and also at Point Lepreau, and these two fellows, Gabrielle Leblanc (phonetic) and George Klunkivich (phonetic), chose to compare the probability of a severe accident -- nuclear accident -- to a commercial airline crash.

How much time do I have left?

THE CHAIRMAN: Five minutes.

MR. DUGUAY: Okay, thanks.

So sorry to remind Dr. Binder and the Commissioners, that this *Nuclear Safety and Control Act* of 1997 is asking you to prevent unreasonable risk to the population, and secondly, to disseminate objective scientific information to the public.

As you know very well, we have written

several letters to Michael Binder and some of them also to Greg Rzentkowski, where we asked many, many questions, dozens of questions, for which we got some answers but some were not answered. Like, for example, what is the PGA value -- the maximum ground acceleration -- that the CANDU reactor can take when aging is taking place with all these spikes? We never got an answer on that one.

Anyway, so our basic -- my basic request to the CNSC is to fulfil to the letter, 100 percent, if possible, this B section of the Control Act of 1997.

And, you know, I am a scientist. I've been in science for the last 45 years. And scientists use numbers. Just to assert bluntly that nuclear reactors are safe, as Mr. Jammal says many times, and as is written in countless CNSC reports, is not a scientific description. A scientific description uses numbers.

They were saying that about the Concord that it was a safe plane. They're always saying that. Whenever you board an airplane they tell you the plane is safe, but that's not enough.

Now, one of the requests we had -- as I said, we had asked many questions and we got some answers. Thank you, Michael Binder for that. But there are many unanswered questions.

And one thing I did not appreciate too much

was your legal counsel type answer to one of our questions. On December 2nd I appreciated very much the discussion that went on in Point Lepreau about the seismic danger. It was a very good discussion for two days, December 1st and 2nd.

And at one point Michael Binder kind of lost patience and he said -- turned to his staff, "Well, you know, suppose we have a magnitude 6.2 earthquake, what will happen?" And Dr. Greg Rzentkowski, who's quite aware of everything that can happen, or let's say many things that can happen, basically answers spontaneously, "Well, you know, with a big earthquake like that we're going to have a core meltdown." Then I did not appreciate the fact that Mr. Jammal came out in local newspapers in Quebec completely contradicting me, saying that, "Well, any kind of earthquake that would happen with Gentilly, the reactor would safely shutdown." Well that's ignoring Fukushima.

So you used that word in some of your documentation, that this Act does not say that the CNSC has to release all information, just information. Yeah, well from a legal point of view you had it, and I'm not about to sue you in the Federal Court. I'm not about to do that.

Anyway, to calculate my probability, I use empirical evidence. So I use much the same method as

Greenpeace so I'll go fast over it. But there's been 15,000 reactor years of operation around the world, five core meltdowns, so it's one meltdown per 3,000 years. So if you're going to run 10 reactors in the Toronto area for 30 years -- 10 reactors, 30 years, that's 300 reactor years -- so the probability of a core meltdown in the Toronto area over 30 years comes to 10 percent. That is not a small risk, 10 percent. That's why the insurance companies have this clause that they will not insure you for nuclear accidents.

I want to use this to make a case for hardening nuclear plants. You want to build your nuclear power plant, you know, we live downwind from you in Quebec, if there's a big radioactive cloud coming out of Darlington we're going to get a lot of radioactivity in Quebec. So I would appreciate your containing this explosion, as the French do.

There was a big lesson from Gentilly 1. You know, Gentilly 1 -- this is what the Canadian Nuclear Association had commented, it had operational -- had design and operational problems.

And the problem with the CANDU reactors is that they were designed 40 years ago and you will find the CNSC documentation mentioned here below, that the physics models, and the software used in those days were

inadequate. So that's worrisome.

Another point is the vulnerability of nuclear reactors to terrorist attacks. All the Canadian reactors are practically on the Seaway, the Great Lakes, and for Point Lepreau on the Atlantic. It would be very easy for a boat to come along charged with explosives and blow itself up and cause a lot of trouble to nuclear reactors. So again, that's an argument to have a very thick containment, like the French do.

What's the probability of exceeding the design value at Darlington? Well, you know from your own documentation, which I have here, that we're talking at the .01 percent level of something like .2G -- that's your PGA -- and you know, your design value was .15PGA -- peak ground acceleration. With worn out pipes I think it would be prudent not to exceed the .15G.

So you have it in your documentation .01 percent per year, .2G. Well a prudent person would not invest in your project. So again, the case for extremely robust hardening of the CANDU reactors.

So here I put all the numbers together. If you compare the worry that frequent flyers should have, flying once a month, 10 times a year for 30 years, he would have a probability of getting into a crash of .03 percent. But using your own data, it's about three

percent for the Toronto area. So it's 100 times more. So a frequent flyer and his wife should worry 100 times more about a core meltdown around Toronto than about an airliner crash.

So I use here Gordon Edwards' idea that .3 percent is not such a small probability. If you roll off three dice you have a .46 percent probability of getting three sixes. And it's a casino game that lots of people play, including myself, but the big difference with the casino game is that in a casino you choose to play, whereas here it's OPG who's choosing to play.

The situation here raises the question of ethics. I teach engineering. We have ethics courses. And engineers as well as government employees are mandated by codes of ethics to reveal to the public the dangers that threaten them.

So again I ask the CNSC to publish what is the probability that you calculate that a core meltdown will occur in the Toronto area over the next 30 years?

Thank you.

THE CHAIRMAN: Okay. Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Who wants -- it's open. Who wants to start?

Okay, well, let me turn to staff. Would

you like to comment on some of the -- it's not the first time we've seen those probabilities. So somebody who wants to deal with them please.

MS. AKL: Good afternoon; Yolande Akl, Director of the Probabilistic Safety Assessment and Liability Division.

I would like first to start with CNSC -- to say that CNSC staff disagree with this gaming analogy that the intervenor is using.

And actually on Tuesday there was another intervenor, a mathematician that supports my opinion, or my statement. It is a wrong application of statistical inference. Comparison with dice is not appropriate in this case because with the dice we know exactly what the outcome is going to be and we also can repeat the experience many, many times infinitely.

So why we cannot use it for reactors. First, we don't have enough statistical data to obtain a representative set of data. This calculation that was presented today is called The Frequentist Approach, which is only applied when the events are repeated infinitely such as flipping a coin or rolling dice. Suppose that we flip a coin, I will just give an example, 10 times and we had 8 heads. Can we say that the probability of having a head is 80 percent? Of course not.

Now, we go to another difference with dice; that the nuclear power plants that are in the example that the intervenor presented are different design, different types, they were constructed in different years, they have different safety systems, they have different operation conditions, different environment, different safety culture, and different location. For example, let's suppose we want to know the probability of a hockey stick breaking. Is it right to overlook its size, its brand, the material it is made of? Is it made of plastic, wood, composite? If we just count the number of breaking, what is the value of the number we are going to get?

Thirdly, these accidents are all from different causes. This is a fundamental misuse of statistics. Comparison with dice is not appropriate as I explained because, once more, the dice, we know, have a number of outcome that is infinite -- definite we know. The experience can be repeated infinitely, but for earthquakes, we are less certain of when they will occur and when these events will happen. They can happen tomorrow or they can never happen in the lifetime of the reactor.

Thank you.

MR. DUGUAY: May I reply?

THE CHAIRMAN: Please.

MR. DUGUAY: So let's assume my calculation is not to your taste, what is your calculated probability that a core meltdown will occur in a Toronto area over the next 30 years; what is your estimated probability?

MS. AKL: The probabilistic safety assessment is not made for predicting. We are not predicting when the next accident ---

MR. DUGUAY: I'm not asking when. I'm just over the next 30 years, whether it's next week or in 30 years, over the 30-year stretch, what does your calculation give as a probability of a core meltdown?

MS. AKL: I don't have the probability of when the next -- the next ---

MR. DUGUAY: Well, if you work for the CNSC, you're supposed to make sure that the OPG project is falling within a certain range. So maybe someone from the CNSC knows?

MR. RZENTKOWSKI: I would like to respond to this question.

Just to continue our dialogue which has started probably a year ago: the subject is not for the first time in front of the Commission and Ms. Yolande Akl identified many problems with the methodology which are clear. But let's assume for a moment it's correct. So let's use the number of reactors, divide by the number of

reactor years, multiply by the number of years in operation, and here we have the probability.

So as you requested, let's talk about the problem at stake. Let's talk about the Darlington reactor or reactors which are here. Combined, CANDU reactors have approximately thousand years of operation, zero accident, zero divided by 1,000 multiplied by 25, it's zero. So that -- the probability of accident is zero using the methodology you applied.

Do we believe in that? No, we don't. That's why we do planning for what is practicable to make sure that the accident is not going to happen or at least to make sure that the probability of this accident will be as low as practicable. What it is? We were talking about this for two days here. We can go back to the assessment of core damage frequency. We can go back to the assessment of large release frequency safety goals and I can give you those numbers. We can do that.

THE CHAIRMAN: Okay. I think we -- you get one -- you're going to give another rebuttal but before we get in -- you're going to have the last word, so you can -- but I want to see if there's any other questions on this presentation.

Okay, go. Sorry, Monsieur Tolgyesi?

MR. TOLGYESI: Mr. Duguay, this is to the

staff and probably to OPG, was saying that the pipes' thickness is about quarter inch which is 6 millimetres and which is much lesser than what they use in Europe, that's what you were saying. Could you comment on that?

MR. ELLIOTT: Marc Elliott, for the record.

You know, our pipe, I think we've got various pipes in the -- in the reactor. I'm not sure exactly which ones are being mentioned. Kind of the most researched and concerned pipes are the pressure tubes and those are the ones, I think they -- and they are -- they are not as thick as what was mentioned. But what we do with those, first of all, they meet all the codes and standards for operation at that temperature and pressure, and we also monitor them very closely. I talked about some of the monitoring that we do, and so did Mr. Webster.

What we also do on outages is we do ultrasonic inspection where we -- called cigar, you may have heard us talk about that in the past where we look for flaws, we look for minor imperfections and we continually monitor those -- those tubes in all of our reactors and we also watch them very closely for aging. Are they picking up hydrogen and could they reach the point where they have to be changed? So we're monitoring that very closely as well, and everything we know about those pressure tubes are that they will last for the

normal life of Darlington.

MR. TOLGYESI: Do you have any preventative maintenance where you are saying you changing without necessarily finding what is a problem.

MR. ELLIOTT: Yeah, our preventative maintenance really for those types of components is this inspection program that I was discussing, so that we -- before we start up the reactor after each outage, we have to do a report on fitness for service to show that that reactor is fit to run to the next outage and that's how we assure safety.

THE CHAIRMAN: Thank you. Anybody else?

I think I'd like to take advantage; I'm told that Dr. Adams from NRCAN is still with us online?

DR. ADAMS: That's correct. This is Dr. John Adams, Natural Resources Canada.

THE CHAIRMAN: Okay. Could you remind us again; in your opinion, what's the largest possible magnitude of earthquake in this particular site, Darlington site?

DR. ADAMS: We have to consider that the way that the engineers do it and the seismic hazard people do it is in terms of the shaking level and that's why we've been hearing shaking levels defined in terms of .3G or other numbers. We have gone back and asked the

question, that shaking level, if expressed as an earthquake, what would our best guesstimate be? And the answer is, for Darlington, it's about a magnitude 6, about 15 kilometres away where the top of the earthquake is basically a 6-kilometre step.

Now, that same shaking level could come from earthquakes smaller than that closer to the plant or larger events further away. And in the total calculation of the seismic hazard, we actually include earthquakes as large as about 7.5 in that analysis; however, those very large earthquakes are further away and because of that, the shaking level would not get at very extreme. For example, the Darlington number that we're working with would be equivalent to about a magnitude 7.0 earthquake, 35 kilometres away. And my feeling is that that is quite a sizeable earthquake. It's obviously within the realms of possibility rather than impossibility, but that is the way the current design is being formulated to accommodate. Thank you.

THE CHAIRMAN: So given that scenario, is the Darlington's structure design now and proposed to be design, has any such -- is it seismically qualified?

MR. ADAMS: That's a question for CNSC staff and OPG I believe.

THE CHAIRMAN: Okay thank you. I was

looking at the OPG. So thank you.

MR. TREMBLAY: So Pierre Tremblay for the record. Yes is the answer but let me just pass it to Marc and perhaps ---

THE CHAIRMAN: Yes is really all I need ---

MR. TREMBLAY: All right, thank you. All right.

THE CHAIRMAN: --- I don't want to get any more than that.

MR. TREMBLAY: Okay, that's fine.

THE CHAIRMAN: Thank you. And staff, do we agree with their analysis here?

MR. BLAHOIANU: Yes, we agree.

THE CHAIRMAN: Okay, anything else?

MR. BLAHOIANU: It was a previous question regarding the thickness of the pipe. I heard this so often and I guess it's a -- it's misleading. Comparing the smaller pipes in the -- in CANDU design like feeders, which are like three inch diameter, comparing with the pressure vessel which has 215 millimetres.

Everybody should know that they affect the thickness. For the same pressure, the thickness is direct proportion with the diameter. The smaller the -- the bigger the diameter, the bigger the thickness. And the thickness for the feeders, it's appropriate with the size.

It's just three inch. This is the reason that you have a thickness of just a quarter of an inch. Thank you.

THE CHAIRMAN: Okay. That's useful. Over to you, you have the last word.

MR. DUGUAY: Thank you Dr. Binder. I want to just make comments on two things. First, the wall thickness; I can find you CNSC documentation where those who wrote those paragraphs were quite worried about letting the pipes thin down from six millimetres to four millimetres. That worried CNSC experts. That worries me too.

Now when it comes to probability calculations, ---

THE CHAIRMAN: Sorry. Sorry to interrupt but correct me if I'm wrong, were they to do with aging, they were talking about or is that what it was about?

MR. DUGUAY: Again and corrosion.

THE CHAIRMAN: So that's the one that triggers a requirement for refurbishment, if I understand how it works.

MR. DUGUAY: Well of course. You do refurbishment because those pipes are worn out, just like the tires on your car.

THE CHAIRMAN: But that's by design. I think that's what makes the refurbishing required every

certain period of years. It's by design. So there's nothing unanticipated in this, if I understand correctly. Somebody ---

MR. DUGUAY: You may anticipate many things but it worried CNSC experts. It worries me too.

THE CHAIRMAN: Okay. Somebody want to take this on?

MR. BLAHOINAU: Yes, because you worry, we have so-called fitness for service. That means that we -- we ask -- it's imposed by the standards in those about the operating licence that operators have to do inspections for -- to demonstrate fitness for service for the next period of -- or for the next interval of operation.

And thickness of the pipe never ever is allowed to be below the minimum thickness detected by the design pressure.

THE CHAIRMAN: Okay, thank you.

MR. DUGUAY: So my final point is about probabilities. My basic request is to get a number from the CNSC about the probability of a core meltdown in a Toronto area over the next 30 years. So you had two speakers from the CNSC who took at least five minutes or more and not giving any number.

THE CHAIRMAN: I thought they had the number zero. I'm not sure that...

MR. DUGUAY: Will you publish that? Dr. Greg Rzentkowski, will you publish in international journals that the probability of a core meltdown in the Toronto area is zero? Why do you have a video on the website that spends minutes on core meltdowns? Why talk about it if the probability is zero?

DR. RZENTKOWSKI: I explained it in my previous response. We don't believe that the probability is zero and that's why we perform a very elaborate probabilistic safety assessment to establish what is the core damage frequency and to establish what is the large release frequency. This number is provided in the Environment Assessment performed for the Darlington Case.

THE CHAIRMAN: Sorry, we need to wrap before there is a major accident -- biological accident here. We have to bring this to a conclusion, so unless you have a final, final, final word?

MR. DUGUAY: Well thank you for your attention and the way you lead the -- this whole work is very good. Thank you.

THE CHAIRMAN: Thank you, thank you very much.

MR. JAMMAL: Mr. President, sorry to interrupt sir. Mr. Duguay ---

THE CHAIRMAN: To do it ---

MR. JAMMAL: Well, no. It's the -- Dr. Rzentkowski responded, said zero base on Dr. Duguay's methodology.

THE CHAIRMAN: Yes, we got it. We got it.

MR. JAMMAL: The scientific methodology is ten to the minus eight. You want a number? That is the number. So with respect to the scientific methodology, okay, it's ten to the minus eight that was -- that we're basing on the safety case with the ISR.

MR. DUGUAY: I challenge you to publish that in international journals. I challenge you.

THE CHAIRMAN: We take it. We take it. We will take all of this. Please. We hear you. That's what the premise of this hearing, to get all comments and read out decision at the end. Hopefully they'll cover those issues. We're going to reconvene at 2 o'clock. Thank you.

--- Upon recessing at 1:06 p.m. /

L'audience est suspendue à 13:06

--- Upon resuming at 2:03 p.m./

L'audience est reprise à 14h03

THE CHAIRMAN: Okay, we're back.

And we will move onto the next submission

by the Green Party of Ontario, as outlined in CMD 12-H13.208. I understand that Mr. Schreiner will make the presentation.

Please proceed.

12-H13.208

Oral presentation by

Mike Schreiner

MR. SCHREINER: Good afternoon Members of the Commission and Mr. Chair. My name is Mike Schreiner. I'm Leader of the Green Party of Ontario. And I appreciate the opportunity to express my concerns with Ontario Power Generation's plans to refurbish and keep the Darlington nuclear reactors running until 2055.

I believe the environmental assessment report has failed to properly address a number of concerns regarding the risk of continued operation of Darlington. I do not believe that approvals for the refurbishment of Darlington should be granted until these concerns are satisfactorily addressed.

My first concern is with risks associated with public safety and short and long-term environmental damage. I'm deeply concerned that OPG has inadequate plans in place to protect human health or the environment.

Significant nuclear accidents are happening around the world about once per decade. It is essential that Canada require the highest level of risk assessment and safety protocols, especially since reviews of nuclear accidents at Three-Mile Island, Chernobyl and Fukushima demonstrate that institutional failures and human error are contributing factors.

OPG's Darlington nuclear generation station risk summary report indicates that accidents involving large radiation releases are realistic though remote possibility. Given the catastrophic risk associated with nuclear accidents, especially on the doorstep of Canada's most populated regions, on the shores of Lake Ontario, I am deeply concerned about insufficient emergency planning procedures at Darlington.

It is irresponsible and unacceptable that the worst-case accident examined by OPG in its application would involve a release of radiation travelling about 3 kilometres from the plant. I believe history demonstrates that this is insufficient and puts the public at risk.

And I believe governments must act to ensure that public safety is a top priority. A more thorough and rigorous analysis of risk and emergency planning should take place before proceeding with any approvals at Darlington.

Further complicating this, in my mind, is that OPG is not held financially accountable for the full cost of a nuclear disaster. The *Nuclear Liability Act* means that in the event of an accident OPG would not pay more than \$75 million for environmental cleanup or victim compensation.

Failure to hold the industry accountable for risk misrepresents the economics of nuclear power and is a disincentive to creating the full risk avoidance policies. Before OPG is allowed to proceed with their proposal to rebuild Darlington I believe OPG and its suppliers should assume full financial responsibility for any accidents or mistakes.

In addition to taking action to protect the public from disasters OPG must also take steps to mitigate environmental damage from ongoing operations. As you've heard previously, Darlington uses Lake Ontario as a source of cooling water and a dump for waste water. It is also a major source of thermal and chemical pollution. In the lake this causes significant harm to aquatic systems killing fish and fish habitat.

Before receiving any approvals to proceed OPG must have plans in place to mitigate thermal and chemical pollution, fish kills and storm water discharge into Lake Ontario.

Additional public safety and environmental risks exist because the nuclear industry has not finalized a comprehensive plan for dealing with nuclear waste. Meanwhile the amount of waste continues to grow.

OPG is unfairly placing the burden to monitor waste onto future generations. As the risks and costs associated with waste management and decommissioning continue to rise it is unacceptable and irresponsible to proceed with refurbishment until proper storage and decommissioning plans are in place.

My second concern is related to financial risk. No nuclear project in Ontario's history has come in on budget or on time. The existing Darlington reactors were supposed to cost 4 billion and ended up coming in 10 billion over budget. I realize that today we're talking about refurbishment and not new build but the record for refurbishment is not that good either.

The recent refurbishment at Bruce nuclear is at least \$2 billion over budget and three years behind schedule. The estimated cost of rebuilding CANDU reactors has ballooned over the past decade from approximately 800 million per reactor in 2002 to 2.5 billion today. Ontario ratepayers are still paying for the debt associated with previous nuclear projects.

I believe that it's unacceptable and

irresponsible that the Ontario government has no plans in place to protect ratepayers or taxpayers from further nuclear cost overruns, including overruns associated with the refurbishment at Darlington.

I believe it is inconceivable that the government has not conducted an independent and transparent review of nuclear costs. The cost of refurbished Darlington estimates vary widely, between 8 and \$14 billion. And just last week Standard and Poor's rating service downgraded OPG's credit rating from stable to negative, in part, because of the risk of cost overruns due to the Darlington refurbishment.

Approvals for Darlington should not be granted before a transparent and independent review of costs take place.

My third and final concern is related that the failure to mitigate safety, environmental and financial risks by not looking at alternatives. I believe it's irresponsible to proceed with Darlington until a thorough review of alternatives have taken place.

And I know it's not your job to examine alternatives but I think it's inconceivable that the Ontario government over the past seven years has prevented any public reviews of the need for, or alternatives to, nuclear power at Darlington.

Some people ask -- I believe the failure to consider that the cheapest and greenest source of electricity is the power we don't use in the first place. Estimates are that we could retrofit 2.3 million homes in Ontario to save the same amount of energy we would get from Darlington at half the cost.

Alternative sources of generation exist. Made in Ontario water power, wind power and bio energy all offer lower costs and lower risk sources of electricity than rebuilding Darlington.

The cost of importing water power from Quebec is less than one-third of the cost of Darlington. And right now we have existing transmission lines in place to replace 75 percent of Darlington with power from Quebec.

The City of Guelph alone has 60 megawatts of renewable energy applications awaiting approval at the Ontario Power Authority.

This is just the tip of the iceberg of what's possible if we empower communities to generate electricity and jobs instead of proceeding with mega projects that have mega risk, requiring mega capital costs and generating mega amounts of waste.

The responsible course of action is for the Ontario government to conduct a thorough review of safer,

cheaper and cleaner alternatives before proceeding with the Darlington refurbishment.

In conclusion, I am deeply concerned about OPG's plans to refurbish the Darlington nuclear reactors. I believe the risk and the costs of nuclear are too hard to justify.

More affordable, reliable, and safer alternatives exist. The Darlington refurbishment should be halted until the need for alternatives to and public safety, environmental risk and costs of nuclear fully and independently considered.

Thank you for your time and consideration today.

THE CHAIRMAN: Thank you.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Questions?

Monsieur Harvey?

MEMBER HARVEY: Just a comment. Except for the costs, which is not our mandate, I think all, if not all of your concerns have been largely discussed during the last three days, so I don't know if you were here or -
- but...

MR. SCHREINER: I decided to not go into detail on some of those because I know other presenters have raised some of those issues, so I decided that I

would go into more detail in some other areas.

But I do want to reinforce the fact that I've had over 400 letters sent to me, people expressing concerns for this particular project and asking me to speak out about it.

THE CHAIRMAN: Mr. Tolgyesi?

MEMBER TOLGYESI: Yes, could the OPG tell us what's covered by financial guarantees because the intervenor is talking about decommissioning or radioactive disposal. What's covered?

MR. TREMBLAY: Pierre Tremblay, for the record.

Just to make sure I'm understanding; you're talking about the segregated funds themselves in terms of what's included?

MEMBER TOLGYESI: Yes.

MR. TREMBLAY: Okay. Well, specifically, the waste itself, low, intermediate, high-level waste, as well as the decommissioning costs associated with the existing facilities and that includes not only the OPG assets but the Bruce Power facilities as well; they're still owned by OPG.

THE CHAIRMAN: I think the intervenor argues that the actual costs of refurbishment are not really known.

I don't want to put words in your mouth but I think that was one of the comments he made and I wonder if you can address that. Is that not what you asked?

MR. SCHREINER: It is one of the questions I've asked. I did raise concerns as well about the unknown nature of decommissioning and waste costs. So I believe all those costs are unknown.

THE CHAIRMAN: Right.

MR. TREMBLAY: Pierre Tremblay, for the record.

And so as the Commission knows, and we've appeared before you on an ongoing basis, decommissioning plans are required to be -- you know -- produced and re-examined, I believe, on a five-year frequency.

We have individuals who can speak to more details but those are in fact reviewed and kept up to date based on specific conditions, and based on benchmarking of a well-documented costs, both in North America and globally; we keep close tabs on that.

So maybe Terry Doran can just elaborate briefly for you.

MR. DORAN: Terry Doran, for the record.

Just to summarize. So in October of this year OPG presented in front of the Commission the financial guarantee cost estimates for the period of 2013

through 2017. In that submission -- it's a detailed breakdown of the decommissioning costs, the used fuel management costs and the low and intermediate level costs.

And as previously mentioned, we update these estimates through the Province of Ontario who independently audits our submissions on a five-year frequency.

THE CHAIRMAN: Thank you.

Dr. McDill?

MEMBER McDILL: Thank you.

It was a long time ago but could I ask OPG to remind me -- as I say it's a while ago -- what some of the cost overruns were way back when Darlington was first constructed, the four to 10 that the intervenor has raised? Those were safety requirements.

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

There were a number of issues associated with the new construction of Darlington. The project was delayed a number of occasions; there were some issues associated with vibration, the heat transport system that required a summary design and there were also some -- some stops and starts to the project which of course led to accumulation of interest charges and so forth.

So that's kind of generally the story.

MEMBER McDILL: Thank you.

THE CHAIRMAN: Okay. You did mention that you accept that it's not our mandate to deal with alternatives and I hope you can engage your colleagues on some policy discussion that should be done at the political arena and not in these particular hearings.

Please?

MR. SCHREINER: I agree with you and I will be -- have been and will continue to engage my colleagues in that conversation.

I do think that this group does have a public responsibility to inform the public of risk and also the fact that there are alternatives to that risk and so that's why I think it's important to bring them up in these hearings.

THE CHAIRMAN: Okay, thank you. Thank you very much.

The next submission is an oral presentation from Ms. Chung, as outlined in CMD H13.210.

Please proceed.

12-H13.210

Oral presentation by

Kathleen Chung

MS. CHUNG: Hello, my name is Kate Chung and I'm speaking on behalf of my five grandchildren who live within range of Darlington and Pickering. I live in Toronto but I lived many years in Durham Region.

I'm really concerned for my grandchildren and your children and grandchildren. I wonder how many of you live in Durham Region; do any of you? How many of you live within 30-kilometres of a nuclear reactor.

MEMBER MCDILL: Chalk River.

MS. CHUNG: Pardon?

MEMBER MCDILL: There is Chalk River.

MS. CHUNG: You live near Chalk River.

MEMBER MCDILL: Well, we're in Ottawa which is downstream of Chalk River.

MS. CHUNG: Yeah, very seriously downstream.

And how many of you have grandchildren and children? Pretty well all of you.

Well, I hope you share my concerns because I know that within my grandchildren's lifetime this world may not even exist anymore. We may have lost the polar ice, we'll have lost the farmland, we'll have lost the trees, we'll have lost the animals, and an awful lot of people and I really need you to take that seriously.

I'm speaking for my grandchildren. I'm a

member of some organizations that I don't officially speak for but which share similar views; the Canadian Voice of Women for Peace, the Older Women's Network, the Canadian Unitarians for Social Justice and the Green Team of my own local church.

There's the Haida proverb: "We do not inherit the earth from our ancestors, we borrow it from our children" and I hope that you'll keep that in mind in all your deliberations.

This hearing is about future generations, it's not about us. And we're saddling them with a poisonous legacy and not one I want to leave for my grandchildren or yours or theirs.

I thought that by the time I died the world might be a better place and in the seventies we thought that's what was happening; but that's not what's happening now. The planet is poisoned and dying and it's our only home. We have to stop this, we have to heal her.

So what kind of future are we creating? What's holding Ontario back from developing renewable energy sources instead of nuclear; the "Old Boy's Network" I'm told is the biggest one of all. They control the power industry and they control the construction industry. And then there's lack of vision.

The government of Ontario must rise above

this and lead. But actually the people are far ahead of the government in recognizing the urgency of the problem and the need to develop renewable resources and to conserve energy.

There comes a time when we all have to cut our losses and it seems to me we've come there now. Sure, we've put billions and billions of dollars into the nuclear industry but there's billions and billions more going to be lost if it goes forward; so we have to just stop, cut our losses and find another way around it.

Not once in the history of the great CANDU has the cost of building or refurbishing any nuclear plant come in on budget or anywhere near budget. The cost overruns are enormous and I am tired of paying the bill.

I refuse to pay one more penny for this -- what's really a get-rich scheme for nuclear executives, ex-politicians, consultants, and super-techies. It's a make-work project for nuclear workers, construction and management and that's all it is.

(APPLAUSE/APPLAUDISSEMENTS)

MS. CHUNG: When Harper fired Nuclear Safety Commission President Linda Keen, it proved to me that safety was not a concern of our government; profit is the concern and that's the only concern. But profit for whom; certainly not for the public.

And why is that notorious Gadaffi supporter SNC-Lavalin given contract after contract with more respect than Linda Keen, who was trying to keep us safe?

And notice the latest charges against SNC-Lavalin people.

And these are the folks that now own our CANDU business.

I just think this is appalling. How can anyone -- any politician, or you, look a taxpayer in the face and honestly say nuclear makes any sense at all, financially, technologically, environmentally, medically or ethically.

You know all the facts. I don't have to give you facts and figures. And you've heard it from everybody else. You know that the hot water release from the nuclear plants is killing the environment, the plant and animal life in the lakes. You know that the closed cycle cooling tower could mitigate this effect a bit, but no, we can't have cooling towers at Darlington because the people in Darlington, the real estate agents, are afraid that will lower the value of real estate because people when they see the cooling towers won't want to buy houses there.

And it's just like in Pickering where the politicians didn't put warning sirens up in all the

neighbourhoods. They had a plan to but they cancelled it because the real estate agents told them that this would drop the cost of real estate in Pickering because people wouldn't want to live there if they saw the sirens.

And then you know all the lessons from Fukushima; that no system is fool proof; that the workers suffer the consequences of so-called accidents; surrounding communities are devastated and decimated, forever poisoned; people in the area are traumatized; farms are poisoned; the surrounding land and water are poisoned, and people's trust in government and industry is destroyed forever.

And I really want to emphasize that, because where I'm coming from I wish I could say I'm happy to be here today but I'm not. I am totally discouraged. I feel totally cynical about politicians, and especially the nuclear industry. I have no trust at all in my government provincially or federally, and you might as well say municipally the way things are going in Toronto right now.

Why would anyone trust any of these politicians? And we have the example of Fukushima to show what happens. The people of Japan do not trust their politicians at all. They do not trust the nuclear industry. And why should they?

And is this what you want for Ontario and Canada?

The St. Lawrence Valley and the Great Lakes are an area where there are earthquakes. There was one fairly recently.

And then there's the matter of Ontario, the radiation levels allowed. In Ontario people can be exposed to 500 times the amount of radiation that they're allowed to be exposed to in California. Is that because we are resistant to radiation? I don't think so. I think it has to do again with the old boy's network.

And what happens when aging concrete cracks? Is the Darlington plant as safe as the Gardner Expressway, as the bridges in Quebec and Montreal?

It's interesting that just recently we've been warned about organized crime taking hold in the Ontario construction industry. What does this mean for the construction refurbishment of nuclear plants like Darlington? Are we at risk of seriously substandard work? And you really have to take that seriously. I'm not just being alarmist. What happens if the concrete cracks at a nuclear plant? We have to care about that.

And what are you going to do with nuclear waste? I hear that they're looking for a town desperate enough to take it. The people in Saskatchewan are getting

worried. And then it's been mentioned, maybe we'll put it up at Horn Payne. Well Horn Payne's right on the CNR's mainline across the country. Do you want a leak of radioactivity that shuts down the town, that kills a whole train load of tourists on a VIA train that irradiates one of CN's entire freight trains?

And no nuclear plant has ever provided reliable power. They all have been shut down for prolonged periods, every one of them.

If nuclear plants are so safe, why are the operators not required to take all the risks in case of a breakdown? Why is their risk limited? And why am I on the hook for the balance? I never asked to build a nuclear reactor. Why should I be on the hook when there's an explosion at Pickering or Darlington and all the people all around are killed?

I think that if these plants are really safe than the builders would be willing to accept full liability for all future damages of any kind, including nuclear accidents, breakdowns, and disposal of spent fuel.

And then there's human error. I won't go into that. I'm sure you heard about that.

And then there's the tritium leaks that occur regularly at Pickering, and I'm sure at Darlington too, and they're kept secret from the public, but they're

in the OPG records.

And there's so much secrecy, even around getting potassium iodide pills, you have to live within a certain area to be given potassium iodide pills, but the public don't even know that they can get them. If you live within a certain radius of one of the plants you can go to a certain drug store and sign in and be given potassium iodide pills.

I'm really worried about my grandchildren. What's going to happen to them? What's going to happen if one of the plants blows and my children are at work and the grandchildren are at school and day care? Do you know the school buses that are supposed to be used for evacuation here do triple duty? The schools are on staggered start and finish times. So the same bus will go to three different schools to take the kids to and from. So if there's a nuclear emergency how is that bus going to pick up the kids from three different schools? It's impossible.

I don't know, back when I worked in Durham region it was part of the -- an exercise around the planning for disaster, I put up my hand and said, "But what about the school kids", they hadn't even thought about the school kids. The police officer said, "Well I guess we'll send them home." Where are mom and dad?

They're at work in Toronto or somewhere. And I don't know how to find out even what the plan is now and how those kids will be saved.

What are the plans for babies in day care? How are they going to be evacuated, and where to?

The plan used to be if Pickering went up that they would evacuate people to Iroquois Park Arena in Whitby and give everybody a shower. It's downwind from Pickering.

I'm really concerned about the disaster plans.

And then there's the long range transmission lines that waste energy. And then there's all the embodied energy that's in a nuclear plant. When you consider the energy required to build it, to make the concrete, to truck everything, all the construction, there's a huge amount of energy wasted there.

And we already have an excess of energy right now in Ontario, why are we paying to give it away? I don't think we need Darlington if we're paying United States to take our power right now and then I have to pay for that on my hydro bill.

What we need is green energy. We need public transit. And we need to serve the public. Nuclear is last century's technology. Surely we don't want

Ontario to live in the past. Energy efficiency, industrial co-generation, combined power plants, smart grids, renewable energy sources deserve to be given the same kind of subsidy and favourable treatment that's currently lavished on nuclear power.

We really have to move into the 21st century for the sake of our grandchildren. So I urge you, don't extend the life of the Darlington plant. Please don't do that, for the sake of all our grandchildren.

And their aging grannies have a word for you. I will only subject you to one verse of the song. We have many songs about nuclear. This one: At our ancient age we take the long view. We see that you're short-sighted plans will not do. Your nuclear plants are wrong and are bad. So watch out young fellers you're making us mad. And it's so long; it's been good to know you. So long; it's been good to know you. So long; it's been good to know you; we declare this world a nuclear free zone for your kids as well as our own.

(APPLAUSE/APPLAUDISSEMENTS)

THE CHAIRMAN: Thank you.

Anybody has a question?

Thank you for the presentation and the performance. Thank you.

I'd like to move on. The next submission

is the Mississaugas of the New Credit First Nation, as outlined in CMD H13.188. I understand that Ms. King will make the presentation.

Ms. King, please proceed.

12-H13.188

**Oral presentation by the
Mississaugas of the
New Credit First Nation**

MS. KING: (Speaking in native language) -- means hello and (speaking in native language) is big thank you for the opportunity to speak to you today.

You have my letter and I have some additional comments I'd like to make. And maybe I guess I've made a slip up, in that I didn't provide you with some history in our documentation about who we are.

So maybe just with that, so starting, my name is Carolyn King and I'm speaking on behalf of the Mississaugas of the New Credit First Nation.

Our traditional territory includes the lands on which the Darlington Nuclear Generating Station sits and on which is proposed the refurbishment that would have four nuclear reactors continuing to operate for the next 30 years.

I have some books. The Mississaugas are a small Anishinaabe group of people, be it Ojibwe -- I'm not sure you understand all of the words about how people refer to us, you know, where there's Ojibwe, there's Chippewa, there's Mississauga, there's Anishinaabe; we're all kind of the same people living in different areas. And at one time, all living very close in area.

And in our history, we come from Northern Ontario, up along the Blind River, the Mississagi River up there. So -- and our name is Mississauga.

The Mississaugas are related to and part the Mississauga, Chippewa, Ojibwe Nations. And some of those people live in this area, you know, right around where we are. We live 70 miles south of Toronto, southwest of Toronto, adjacent to the Six Nations Indian Reserve, and we've been there since 1847. And we moved out of the Toronto area and the City of Mississauga, which carries our name.

You know, they come and ask us to carry our name and we said yes. Today they forget where they get their name from and they forget who we are. With all the different people who have come forward, with all the changes that have happened on our lands, that we get forgotten. So some of that is what I'm talking about here today.

So City of Mississauga is named after us. As well as the Toronto area. And you know we just settled a land claim; 200 years to settle that claim. That's a long time for our people to be patient to settle a business transaction.

But we're gathering up our history, we're taking our position forward about who we are, where we are today, and where our traditional lands are.

So we move from the North in the 1600s, we move south around the Lake Simcoe area and some of our relatives are still living in all of those areas. The Mississaugas in 1847 moved from the Toronto area where they had settled all along the head of the lakes there. Our people have been living along the St. Lawrence River all the way to the Lake Huron, Lake Superior, all over that area, and we have lots of northern brothers who are Ojibwe people, or Anishinaabe as well call ourselves in our traditional language.

So that's just a bit about us. So we've been living there in southern Ontario and actually live about 20 miles from the Nanticoke Generating Plant. So we see the brown streak every day and I say to our citizens, "When we don't see the streak, it means either it's blowing south or we're in it." So we live with that kind of hydro impact in our daily life, and have concerns about

that; how we're going to live in our future.

So just to move on with my presentation that we are concerned with the Ontario Hydro -- Ontario Power Generation proposal to keep the Darlington Nuclear Generating Station operating until 2055.

The Environmental Assessment Report indicates that the consultation and communication plan for the EA identified the host and the adjacent communities as the area of focus for communication.

This is our traditional territory, or the Mississaugas of the Credit. We became New Credit when we moved. You get these names, you get Mississauga, we call ourselves, you know, Ojibwes, that people get confused about who we are. So when we moved from the Credit that we moved to where we are today and called ourselves New Credit. But we're still the same people.

Oh, I've got to make another comment about the Credit. We're called the Credit River Indians because in the beaver trading -- beaver pelt trading, the fur trade, our people traded with the French and the British, and sometimes there wasn't enough pelts to make the trade with the goods. We might argue that today but in that day our people, they paid for the trade on the next trip, and they would put it on credit and our people became known as "good credit Indians" because of the business transaction;

we paid up on the next trip or somebody in the community paid so that they would always be in good standing with the traders. And that name evolved and that's why we became the Mississaugas of the Credit, and kind of identified as different from the other Ojibwe/Mississauga Nation people.

So we got that name because we're good business people, and I like to think today that we still do that and still pay our bills. So that's the Mississaugas of the New Credit.

So back to my topic here. Our First Nation was barely identified in the consultation and communication plan for the Environmental Assessment. No presentations were provided to our community. Our community was not consulted on the selection of value ecosystem components for the Environmental Assessment, nor was our community consulted on potential effects on our Treaty rights and our ecological and land use interests, or any other aspect of the Environmental Assessment.

Attempts at consultation with our community appear to be limited to notification letters and follow-up phone calls. We do not view that as meaningful consultation. Our participation in the Joint Review Panel conducting the Environmental Assessment for the Darlington new nuclear panel should not be construed as participation

in the Environmental Assessment for the proposed refurbishment and continued operation of the Darlington Nuclear Generating Station.

Our primary concern with this Environmental Assessment is that we have not been properly apprised of the nature of the project, have not been meaningfully consulted, and have rights and interests that are not addressed in the environmental assessment Report.

Furthermore, we have not been afforded the resources, funding, or capacity to effectively participate in the Environmental Assessment. Our concerns with the project include:

Effects of accidents and malfunction on our Treaty rights and Aboriginal interests. There are no provisions respecting our Treaty rights and Aboriginal interests with respect to the emergency planning, emergency response, and evacuation.

The impact of the project on Lake Ontario including fish and fish habitat: We know from my personal experience, we live, you know, like I said, 20 miles from Nanticoke. We used to fish there before the plant was put in place. And like, you know, we go smelt fishing in the springtime; nothing today. We cannot do that anymore. It was an annual event that we went and, you know, fished just like anybody else. Collect them up in five-gallon

pails and took them out, cleaned them and ate them.

Like, they changed the water, the quality of the water and the way that the fish can go upstream; not possible anymore adjacent to the Nanticoke Plant. So we know there's impacts from big hydro generation plants.

The next item here, adverse environmental effects on species and species habitat critical to our way of life; lack of the inclusion of our traditional knowledge in the Environmental Assessment's approach to impact assessment; lack of involvement of our First Nation in reviewing and determining mitigation with respect to our Treaty and Aboriginal rights, and our way of life.

We request the Proponent and the Federal authorities immediately provide us with resources, funding, and capacity to effectively participate in the Environmental Assessment, including conducting traditional knowledge and traditional ecological knowledge studies, conducting traditional land use studies, identifying value ecosystem components and participating in a special review of the Environmental Assessment Report with respect to our Treaty rights, Aboriginal rights, and our way of life.

Furthermore, Ontario Power Generation and the Canadian Nuclear Safety Commission and the Mississaugas of the New Credit First Nation must embark on a process of reconciliation. We cannot allow approvals of

nuclear projects and approvals for future OPG projects to override our Constitutional and Aboriginal right.

It is time for reconciliation.

We would like to embark on a reconciliation process that the Canadian Nuclear Safety Commission, which licenses nuclear plants across our traditional territory, so that we do not have to make a similar statement in future Canadian Nuclear Safety Commission hearings.

We would like to embark on a reconciliation process with OPG which across our traditional territory builds and operates nuclear, coal-fired, and hydrogenation facilities, participates in a wide range of ongoing facility permit and approval processes, and manages legacy industrial sites that may have contamination issues and may experience land use changes.

So what is reconciliation? It is an open, honest, and respectful and honourable process to build and renew relationships with our First Nation and the Canadian Nuclear Safety Commission, and our First Nation, and with OPG.

We will be asked by both, the Canadian Nuclear Safety Commission and the OPG to participate in future consultation processes around a variety of approvals.

Both the Canadian Nuclear Safety Commission

and the Ontario Power Generation will likely be conducting business in our traditional territory for many years beyond the 30 years identified in the current application in front of the Canadian Nuclear Safety commission.

We expect those future processes, unlike this one, to have our First Nation engaged in meaningful consultation. We are patient and we understand long time claims. 200 years to settle one claim. That's just one example.

THE CHAIRMAN: Okay. Thank you.

MS. KING: Yep. Could I just ---

THE CHAIRMAN: Okay.

MS. KING: Yep. Could I just -- can I finish just quickly?

THE CHAIRMAN: Very quickly, please.

MS. KING: Okay. We are being asked to participate in the future ones so that we would like to understand that we will not be on the sidelines for treaty rights.

We would like to propose that our stories -
- each of our stories be told, that each current and future use of natural resources, that we understand each other's long-term aspirations, and that each other's approaches to environmental stewardship and environmental management and environmental enhancement, each other's

economic and financial realities and goals.

And that we understand each other's ways and means to make decisions with respect to the people to who we are responsible. We plan to live, work, harvest and enjoy the taking care of our traditional territory for countless futures.

The current application also has no understanding of who we are and the process has not been respected -- has not respected the duty to consult and accommodate. And we ask that we work together to ensure that will not happen again.

So you have my paper and I said we have a - - I have a mantra that I have developed since I worked in this position. And that we want recognition of who we are and where we are, recognition of who's land it is, access to traditional territories and I say fire pits to do ceremony. Thank you.

THE CHAIRMAN: Okay. Thank you. Who wants to start? Dr. Barriault?

MEMBER BARRIAULT: Thank you for your presentation. How far are you from the plant?

MS. KING: We live, like I say, from Hamilton -- Lake Ontario -- we live 25 miles south of Hamilton. We're in the foot of southern Ontario. So we

don't live here. Like, our Reserve lands is not here. We are -- this is what we call our traditional territory along with the other Nations.

MEMBER BARRIAULT: Okay. Hunting area or --

MS. KING: Yes, our people hunt up in this area. Fish, -- we -- personally I fish up in this area.

MEMBER BARRIAULT: Okay. Do you have a communications system with OPG? Do you have good communication lines with OPG?

MS. KING: Yes, we have very limited, you know, people at our First Nation to do this. It's kind of like me and a few other people.

MEMBER BARRIAULT: Okay, yeah. Does OPG care to comment on the relationship with the First Nations?

MR. TREMBLAY: Pierre Tremblay for the record.

I'll ask Donna Pawloswki to talk about our relationship.

MS. PAWLOWSKI: Donna Pawlowski for the record.

Carolyn, we have a -- we know Carolyn. We've met with the Mississaugas of New Credit First Nation staff a number of times on the Darlington New Nuclear

Project. And we have, as Carolyn mentioned, provided notices to the Chief in Council with respect to this project.

And we are committed to meeting with the Chief in Council and staff to talk about the implications and their interests in this project. And I think that fairly characterizes our relationship.

MS. KING: As is it developing...

MEMBER BARRIAULT: You mentioned reconciliation. And what is it that you mean by reconciliation with the CNSC, with OPG?

MS. KING: On our side, you know, we've been changed and our land has been taken over many times. And I did present here, at the New Nuclear one, and talked about the way assessments are done and how we are, in a way, ignored or identified as insignificant.

Few insignificant and they just dropped it while they were passing through. Important things to us. So when we talk about the way that we're acknowledged or recognized, it feels, and I think history will confirm that, that we are easily ignored. And we are stepping up now to say, no more ---

THE CHAIRMAN: Okay.

MS. KING: --- that we want to talk, we want to respond.

THE CHAIRMAN: Can you help me? You need to help me with something ---

MS. KING: Yeah.

THE CHAIRMAN: --- because that wasn't my impression. I thought there -- and somebody correct me, I thought there were extensive consultation on this project.

In fact, we invited people to apply for funding support and some of your neighbor friends, the Williams Treaties, actually took us up on it and they got some funding to participate in this. So can staff tell me what kind of actual formal consultation took place and why were Mississauga not part of it?

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

I too have been working with Carolyn. We've interacted with the Mississaugas New Credit on the Darlington New Build file, as well as on this file.

With respect to our approach to Aboriginal consultation, we took the whole of government approach. And typically what that meant was, we have sent a lot of information to the Mississaugas of New Credit like the other First Nations and Metis groups that we've dealt with. And that's included, as Ms. King mentioned, through notification of the project.

We sent out what we call our scoping

information document. And Ms. King and I had a chat about that in July because, and rightfully so, a lot of times people get confused on the New Build Project versus the Refurbishment Project.

And we talked about archeological matters because in the New Build, for those who remember that project, they did come across some archeological artifacts. And we were discussing that with respect to Refurbishment Project, explaining that the area of where the works and activities were to take place were previously disturbed areas.

With respect to the participant funding, we did send out a letter to Chief LaForme and Margaret -- I apologize if I don't pronounce her last name correctly. Is it Sue? Salt?

MS, KING: She's the Sault.

MR. McALLISTER: My apologies. Along with sort of when we decided to extend that application period for a little longer. We sent the sort of follow up on that and we've also sent the draft -- Environmental Assessment screening report.

So I would say, in short, the Mississaugas New Credit First Nation, we've treated them in a similar manner to other Aboriginal groups that we've engaged on the file, which is a total of 18 different groups or

organizations.

We certainly -- given -- you mentioned the Williams Treaties First Nations, given their location and where the location -- this plant is within their treaties, we certainly had more, I'll say, interaction with them. We had a meeting with the Williams Treat First Nation in July. We did not have such a meeting with the Mississaugas New Credit First Nation.

THE CHAIRMAN: So why -- I'm curious, why didn't you apply when -- given the opportunity to apply, why didn't you apply for some funding support?

MS. KING: There's only Carolyn in the office.

THE CHAIRMAN: Okay.

MS. KING: And the pile of papers as high as that back there. And under the duty to consult and accommodate, now the -- I say the response to the requirement of that Supreme Court Ruling is to just send us a pile of paper that we can't all get through.

And I think we just run out of time to get to it and we've been working. We're very busy. We're a small First Nation and we try to address and we're trying to make a -- as we're suggesting in our document, a overarching document that will help get our concerns out there for all future things.

So we're looking to get to that level and maybe we're just a little bit too late.

MR. McALLISTER: Sorry. I would just like to add -- Andrew McAllister for the record.

Like anything else, and I think OPG would agree, we're always looking to improve. If we can improve on the way we engage with Aboriginal Groups and Carol and I have had -- Ms. King and I have had this discussion before, recognizing the limited capacity that we have. So we'll certainly investigate that further.

We also need to recognize that this environmental assessment is not the end point for our engagement with the Mississaugas of the New Credit First Nation. We will be -- should this environmental assessment be approved, we will be back in front of the Commission in 2014 for the renewal of the power reactor operating licence for the refurbishment activities which -- I look at your list of concerns, those will be -- would be part and parcel of that.

And again, we can certainly work with you to improve upon how we can engage you on that future activity and other future CNSC activities of interest to your First Nation.

THE CHAIRMAN: Okay, let me ask, are there any more -- kind of -- questions?

Dr. McDill?

MEMBER McDILL: Thank you.

Is there a table available -- a nice straightforward table available that shows on the CNSC website all the hearings coming up? I know you can see them individually, that would have intervenor funding associated with them so that this First Nation or any other First Nation or any other intervenor for that matter can go and see when funding might be available and dates that should be applied for?

MR. McALLISTER: Andrew McAllister, for the record.

It is up on our website, there's a -- when you get to the main page of the website there's the participant funding link, I'll call it. As well, for all intervenors or interested parties, you can subscribe to our subscription list where all notices, such as participant funding opportunities, notices of hearings and licences would get sent out electronically.

So I would certainly encourage all interested parties to sign up for that.

The details can be found on our website, and how to do that in order to receive that information in a timely fashion instead of relying upon checking -- having to remember to check our website and notice that

something was up there.

Certainly the web subscription list is the best means to be kept up to date on information being disseminated.

MEMBER MCDILL: If I can ask the intervenor; is that something that would be of use or would there be something that would be of more use with respect to making sure that, if there is a funding application, that you know ahead of time and can maybe get the ducks in the row?

MS. KING: To respond to that; I do -- I'm two years in this position, to work for the Band on this, and getting up to speed on what this process actually is and to have to respond -- you know -- adequately on behalf of the First Nation. So I have been applying to websites that give notification, like CEAA, those ones like that.

So I see some of those national stuff and Hydro announcements come through to the office, through the Chief, and things like that and then get to me eventually to look at.

So, yeah, I think that would be useful to make sure that I'm on that and know about this future need.

THE CHAIRMAN: The advantage is you can bypass the Chief, it'll go directly to you.

MS. KING: You tell him.

THE CHAIRMAN: He doesn't have to -- this is individual subscription. You go onto our website and you sign on this RRS, any citizen in Canada can do that. All you have to do is a web link.

MR. McALLISTER: I will -- I will follow-up with you and send you the details.

THE CHAIRMAN: Okay, anybody else?

Okay, you have the last word.

MS. KING: Thank you for listening to us. On behalf of the First Nations people of this province of Canada I would like to reiterate that under the duty to consult and accommodate that our people are looking to participate in all the future development.

And -- our way of life have changed; our people, the Nishnawbe people still live in this area and on these lands and waters and waterways, our resources we still use.

Our way of life has changed so much under the focus of growth and development. And in and on our lands we live on and use in -- that we used in a daily basis. We're just asking that no more that would be covered over, driven over, built over, ploughed up, changed with no regard to that past. So no more that they go forward in this fashion.

So we're -- I think we're -- our people are looking to participate. We turn on the lights every day too, you know, so, you know, there's ways to live and -- but not destroy the world that we all live in.

So (speaking in native language). Thank you.

THE CHAIRMAN: Thank you. Thank you very much.

(APPLAUSE/APPLAUDISSEMENTS)

MR. LEBLANC: Madame Chung, if you have a question, I would ask you to put it in writing and give it to Louise at the reception desk.

Thank you.

MS. CHUNG: I would like to get an answer now.

MR. LEBLANC: You may. Well, we'll consider the question and it may be dealt with during the question period that will follow the interventions.

THE CHAIRMAN: Okay, we move now to the next submission, which is an oral presentation for Mr. McNamara, as outlined in CMD H13.180.

He's joining us by teleconference. Mr. McNamara, can you hear us?

Mr. McNamara? Is he on?

Mr. McNamara, can you hear us? Mr.

McNamara, hello?

Okay, we'll connect, in the meantime maybe we -- we'll do the written submission.

MR. LEBLANC: So, as I mentioned earlier today, we completed the oral submissions yesterday, however, two of the oral presentations that were scheduled to be presented today have been converted into written submissions.

MR. McNAMARA: Hello, can you hear me?

THE CHAIRMAN: Mr. McNamara?

MR. McNAMARA: Yeah, I can hear you; I couldn't hear you before.

THE CHAIRMAN: Okay.

MR. McNAMARA: I could hear you before but you couldn't hear me.

THE CHAIRMAN: Okay, you're on, please proceed.

12-H13.180

Oral presentation by

Pat McNamara

MR. McNAMARA: Okay, thank you.

I'd like to start off by commending Mr. Binder for treating intervenors with far greater respect

and integrity than we've ever seen from the CNSC in the past.

I'd like to pay respect to one other person I came to know when I first started researching nuclear issues in Port Hope, almost a decade ago. I knew nothing about the industry or the technology at the time so I went online to research a technical point and came across Dr. Rosalie Bertell's name.

Though I had no idea who she was I sent her an email asking for help. She replied within minutes with a 10-line paragraph on the issue, along with the following instructions.

"You do not have time to learn about this before your meeting. Drop this into your presentation and attribute it to me. They will not ask you questions as they will not understand what you're talking about."

This renowned doctor/sister/lady took the time out of her busy schedule and promptly responded to a neophyte.

Sadly we lost Sister Bertell this year after a lifetime dedicated to holding the nuclear industry accountable. I'm sure she's smiling seeing this many interventions.

Though Dr. Bertell could have written the following words they actually come from a report on the

safety of Ontario nuclear reactors by the select committee on Ontario Hydro affairs. Quote:

"It is not right to say that a catastrophic accident is impossible. The worst possible accident could involve a spread of radioactive poisons over large areas, killing thousands immediately, killing others through increased susceptibility to cancer, risk in genetic defects that could affect future generations and possibly contaminating large land areas for future habitation or cultivation."

Unquote.

Ontario has done little to prepare for an accident of this magnitude nor is it capable of doing so.

Patsy Thompson and the CNSC are considering a 10-kilometre impact area for an accident to the reactor. Have they seen no coverage of Fukushima.

The environmental assessment on Cameco in Port Hope considered a 10-kilometre impact area and we were repeatedly assured that any potential impact from Cameco was only a small fraction of the dangers presented by the reactors.

Why don't we have a commensurate larger size for impact area.

The people from Fukushima and the rest of Japan were given the same false assurances the CNSC are giving us.

Ontario is considering the refurbishment to the Darlington reactors to allow them to continue to produce electricity that's it's too cheap to meter.

As we've seen over the past 50 years, the nuclear industry has never been able to keep this promise.

There have been massive cost overruns on every project they've undertaken in this country.

AECL originally claimed the CANDU reactors have lasted for 40 years, but the first CANDU reactors were shut down in 1983 at Pickering after 12 years of service for re-tubing. All four Pickering A reactors were re-tubed over the following 10 years.

In 1997, all four Pickering and three Bruce Power reactors were shut down for accumulated safety problems and lack of reliability.

In 1999, Ontario Power Generation estimated it cost \$1.1 billion and took three years to get all four Pickering A reactors back in service.

The cost to repair Unit 4 was \$800 million over budget and two years late. They spent more money

fixing one reactor than the original cost estimate for all four.

OPG went ahead and fixed Unit 1 at a cost of \$1 billion. Due to the delays and massive cost overruns of the first two reactors, OPG decided to permanently shut down Units 3 and 4.

By 2005, Bruce Power started Reactors 3 and 4 at a cost of \$720 million, which was more than double their initial estimate of \$340 million. Bruce Power's most recent refurbishment was more than \$2 billion over budget and they contaminated over 500 employees and contractors with alpha radiation. This event showed how poorly prepared the CNSC and our government are if there is an accident.

AECL had the only laboratory in the country that was certified to test the people who were exposed to alpha radiation, and it was only able to process 10 people per week.

The CNSC had to meet to certify other facilities in the United States to help with testing. How would you like to be one of those 500 people that had to wait for months before tests could be conducted on them?

Point Lepreau was more than a billion dollars over budget on their refurbishment and Canadian taxpayers had to cough up \$200 million for cost overruns

in a South Korean refurbishment by Atomic Energy Canada Limited.

Then the nuclear missiles came along. By 2009, plans were made to build four reactors in Alberta, two in Saskatchewan, two at Bruce Power, one at Nanticoke, two at Darlington and another one in New Brunswick. All have been aborted except for Darlington, and it's on life support after AECL quoted a price of \$13 billion per reactor. No one could support reactor construction at these prices.

The high cost and uncertainties of refurbishment led the Quebec government to order the closure of Gentilly-2 this month. In the words of the President of Hydro-Québec, Thierry Vandal:

"We are tracking similar projects that started in New Brunswick and South Korea, and what has come out of these other projects are significant cost overruns and significant cost increases."

Dominion Nuclear in the United States recently announced that the Kowanee reactor in Wisconsin will permanently shut down in the spring. Reactors in Florida will be closed before long because they need cost-prohibitive repairs.

Only two of 54 reactors in Japan are operating. Residents are fiercely opposed to any more starting up.

The industry cost from the Fukushima catastrophe motivated governments in Germany, Belgium, Switzerland, to announce plans to phase out nuclear power. Germany has already closed half a dozen reactors.

This hearing isn't about part of a nuclear renaissance in Canada. It's a last gasp of a dying industry. There are no longer other projects on the horizon in Canada.

The intention to build small reactors for the tar sands has no basis in reality and we exposed it as such in Alberta.

The impact from reactors is felt well beyond the 10-kilometre zone. It is felt all the way to Saskatchewan, where millions of tonnes of mine tailings lay, where they were abandoned. It's being felt in impoverished Saskatchewan communities which have been divided over a repository for high-level radioactive waste from your reactors.

There's a great deal of confusion in Northern Saskatchewan with the term willing host community as it pertains to Nuclear Waste Management Organization, or NWMO, attempting to find a host community. This matter

must be cleared up before the process of educating northern residents in Saskatchewan proceeds any further. After all, how does NWMO or our groups know who to educate if the affected surrounding communities haven't been identified?

A letter signed from CNSC President, Michael Binder, from March 2010 provides some of the answers. The letter states:

"When the CNSC receives a licence application, CNSC staff undertakes a careful analysis to identify all potentially interested and/or affected persons. Dependent on the application, those persons could be within a municipality, a region or a province, and they're not necessarily limited to a community."

The CNSC letter makes it very clear that the CNSC determines the parameters of the community that must be consulted for its willingness to host a project.

The problem with this definition is that the CNSC does not do so until it receives a licence application.

In the case of the high-level waste storage facility, the licence application is still many years

away.

The CNSC must change this policy now so that we can educate and consult with the appropriate communities.

The conduct of the nuclear industry's Nuclear Waste Management Organization, or NWMO, in Saskatchewan, has been reprehensible to date. NWMO officials and their paid henchmen have targeted youth in the north to get their message across. Paid agents from NWMO were illegally taking students out of school in Pinehouse to indoctrinate them on the benefits of having high-level nuclear waste in their communities.

The youth in Pinehouse saw through the charade and started opposing them all. Pinehouse once had a vibrant Youth Town Council led by 15-year old Regan Misonas. It all started unravelling when Reagan and his Council voiced their opposition to NWMO's waste storage site.

Town Council and the Executive Director of the Métis Council, Vince Natomagan, tried to get Regan to change his mind by offering a number of inducements aimed at youth in the community. Regan wouldn't change his mind, so Council responded by shutting Regan out of any further involvement with Town Council.

NWMO's Aboriginal liaison, Pat Patton, and

another NWMO staffer called Regan into a meeting shortly after with no one else in the room or in other offices. They interrogated Regan for an hour over his stance on the waste repository. Regan admitted he was 15 years old -- or admitted he was afraid after this encounter.

The primary story came after Regan spoke at a public meeting of 200 people in Bovald, organized by the Committee for Future Generations. Jim Sinclair, who's a paid advisor to NWMO was the next speaker. He told the audience they had to take NWMO's proposal seriously as it would mean a lot of money to deal with the suicides, drugs and alcohol in the community. Then he pointed at Regan and said, "You'll be in jail before you even graduate, so you might as well go hang yourself with your Métis sash."

People in the room were stunned at this inappropriate attack on a 15-year old whose only crime was that he was concerned about his community's future.

This attack by NWMO had the desired results. Regan's parents forbade him from any further involvement in the issue and with the Council in Pinehouse.

NWMO saw nothing wrong with Jim Sinclair's disgusting outburst as he continued to represent NWMO at subsequent meetings.

Though these impacts are happening

thousands of kilometres away, they are being caused by the reactors you want to refurbish because of the waste they create. These reactors are responsible for the mine tailings contaminated in the North of Saskatchewan as well.

Canadians are also exposed to radioactive material from transportation, refining, conversion, rod manufacturing and from the reactors themselves.

The experts quote statistics in gigajoules per litre, microsieverts per hour, new working levels, rads and greys to tell us we're safe, but after 10 years of study and personal research, the sad truth is that a single particle of radioactive material from any of the aforementioned sources can cause a cancer, a death or a mutation. The rest of it is just smoke and mirrors.

Dr. Buttel PhD was right that day when she said none of the councillors would ask me any questions, but she didn't warn me that they wouldn't answer any of mine, and that's been a constant to the present day. We can't get to nuclear industry, the CNSC and our elected officials to answer questions on nuclear issues.

And to you personally, Mr. Binder, you promised us last year at the hearing, I believe, in January that the CNSC would answer our questions, and to this point in time, they have not.

Thank you very much.

THE CHAIRMAN: Thank you.

Okay. Questions?

Just since you mentioned me, I answer my correspondence all the time, so I don't know what you're referring to, but we do answer questions that are sent to us.

MR. McNAMARA: I've sent questions that ended up at a Mr. Gervais that was sent to you specifically, and he responded by saying they would not answer the questions. If I wanted answers, to contact Cameco, which I did, and subsequently no answers from Cameco as well.

THE CHAIRMAN: Well, some questions ---

MR. McNAMARA: That was on internal emitters. That was on issues in Northern Saskatchewan.

THE CHAIRMAN: Some questions that have no relevance to me or to the organization will not be answered.

MR. McNAMARA: Well, internal emitters should have a concern to the organization.

THE CHAIRMAN: Okay. Thank you. Thank you for your presentation.

MR. LEBLANC: We'll now proceed with the two written submissions that I alluded to earlier. So the

first one was H13.189 that was received from Ms. Kay Cumbow.

12-H13.189

Written submission from

Kay Cumbow

THE CHAIRMAN: Okay. Say the number again.

MR. LEBLANC: Thirteen point one eight nine
(13.189)

THE CHAIRMAN: One eight nine (189) -- 186,
189. Got it.

MR. LEBLANC: As there's no questions --
oh, there's a question. Sorry.

MEMBER MCDILL: Thank you. Could I have a
status -- I realize again this is a little out the scope
of today's deliberations but the status of Elliot Lake and
the monitoring that's going on in the Elliot Lake area?

Is there someone from staff who is able to
answer that?

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

I'll start off by giving some background
information and then I'll pass it onto Bob Barker.

Elliot Lake is -- there are several, I

guess, decommissioned mine sites that have tailings areas. Basically Rio, Algom and Denison are licensees they're under CNSC licenses. They -- we conduct compliance programs, inspections of those sites.

They are required to submit their environmental monitoring program to the CNSC for review.

And I'll pass it onto Bob to give you some more details about Elliot Lake itself.

MR. BARKER: Thank you. Bob Barker, Senior Project Officer in the Waste and Decommissioning Division.

The Elliott Lake mine sites of course are all closed. The mines did operate -- began operation well before regulation was established. And the intervention does make reference to dam failures and significant environmental impacts from that period. And that is correct.

But again, they were developed before they were actively regulated. And environmental considerations were not really taken into account in their operations.

Currently the mine sites are all fully decommissioned. They are not impacting the environment. They are subject to regular dam inspections. No dams have failed since the mines have been decommissioned.

The sites are stable. And the mining companies operate a watershed monitoring program called

the Serpent River Watershed Monitoring Program which monitors the response of the whole watershed and the healing of that watershed because it was significantly impacted when those mines were operating.

The watershed monitoring program operates on a three-year cycle. Reports are submitted. And the health of the watershed is fully restored.

MEMBER MCDILL: Thank you.

And that monitoring data would it be available to this intervenor if she were to ask you where it is? Not in this intervention presumably but at some other time?

MR. HOWARD: Don Howard for the record.

Yes that information would be available.

MEMBER MCDILL: Thank you, Mr. Chair.

MR. LEBLANC: The second submission was from the Physicians and Scientists for a Healthy World.
H13.199

12-H13.199

**Written submission from
Physicians and Scientists
For a Healthy World**

MR. LEBLANC: So that concludes the written

submissions, Mr. President.

THE CHAIRMAN: Okay, thank you.

Now comes the round of questions, right -- are we now in there -- where we have some questions that were posed from the floor. So the first one is -- I don't know if I have to identify who said it? From Greenpeace.

So the question is -- it's a clarification.

OPG stated that it did not specifically ask for the *Nuclear Liability Act*. Question: Would OPG be willing to proceed with the Darlington refurbishment and continued operation if the federal government removed the cap on its liability for offsite radiation releases?

It's a leading question because I think the legislation is a policy of the Government of Canada. So, anyhow it's an interesting question.

MR. TREMBLAY: Pierre Tremblay, for the record.

I think this was discussed in fact. There is legislation before the Parliament and there's a proposal, and has been a proposal, to raise the liability insurance cap to \$650 million. At least the last time it was. We supported that. We presented ourselves before the committee that was studying this proposal and would do so again.

THE CHAIRMAN: No, I think the question is

a hypothetical question -- the hypothetical, if there were -- if there was no cap would the OPG project go away ---

MR. TREMBLAY: Pierre Tremblay, for the record.

We're accountable. I mean I think the discussion was fairly clear when this was discussed. We're accountable and liable for the -- you know, for our operation. And it has no impact on the way we operate the site.

THE CHAIRMAN: Thank you. The second question is -- let me see if I can read the handwriting. Why does OPG or the government not just send money to the First Nations instead of asking for more and more forms to be filled out?

I don't know on what planet this person lives? You ever see a government gives money without a form. I don't think that's doable. But it should be a simple form; I'll go along with that.

So I think it was a -- I think the form from CNSC is pretty simple and straightforward.

MR. MCALLISTER: Andrew McAllister, for the record; Environmental Assessment Specialist.

Yes, the form for participant funding is a very simple form. And I encourage the person who put the question in, and others, to go to our website and check it

out.

And certainly -- and the objectives of the participant funding program are laid out on that website. And you saw by -- I think -- these proceedings that the applicants who are successful brought well-informed interventions to the process.

Thank you.

THE CHAIRMAN: Does the OPG have kind of a funding support like this? I don't know.

MS. SWAMI: Laurie Swami, for the record.

I'd ask Donna Palowski to provide a little bit more information if it's required. But generally the participant funding is offered through the Government of Canada, not through the Proponent.

THE CHAIRMAN: Okay, thank you.

Dr. McDill, you had something related? Go ahead.

MEMBER McDILL: OPG brought someone up from the back. No? Just in case, all right.

Often forms appear a little bit intimidating even when they're apparently simple.

Is there an example also on the website of a sort of -- a generic successful application?

This is something that many scholarship -- you know, for high school students, university students a

typical -- and even big government grants.

MR. MCALLISTER: Andrew McAllister, for the record.

Not that I'm aware of but in our continuous improvement, as CNSC does, will take that and work -- bring that back to our participant funding group who may be able to put that into action.

THE CHAIRMAN: Okay, thank you.

We can now start the last round. Okay, so everybody get their books -- I guess we have to get our books.

Okay, I think I've just been asked for a short break; let's take a 10-minute break, please.

So 25 to 4 we'll be ready.

--- Upon recessing at 3:21 p.m./

L'audience est suspendue à 15h21

--- Upon resuming at 3:37 p.m./

L'audience est reprise à 15h37

THE CHAIRMAN: Okay, I think we are ready to go and what we are proposing to do is to do, by the way, OPG you know, I've been telling to all intervenors that they have the last word, but you guys actually going to have the last word. So the point here is now that

we've heard a lot of material, a lot of questions and we'd like to go in order and start, there's been three licences being considered, so why don't we start with the application for the licence renewal to 2014 and what we're going to do is open up for questions and go through until we exhaust those questions, then move to the waste management and then the EA, okay? So everybody can get their books. So the first one is the operating licence extension or renewal.

So we are -- we are open to question and Monsieur Harvey, you don't have to ask any question if nothing comes to mind. Okay, you can wait for the next round. Okay, Dr. Barriault.

DR. BARRIAULT: The question I guess that begs an answer is we -- we seem to have a breakdown in communication between emergency response alarms and -- and what's actually happening. Yeah, you know, I realize that over the last two or three years, at least, I've seen quite a bit of improvement really in the early warning systems, alarm systems, but there seems to be still a lack of understanding, communication. I know that we're going from -- from the station to provincial EMO's to different groups but is there any way we could tighten up this emergency response system for the forthcoming licence and I guess I would like to start off with -- with OPG if

that's okay and then, CNSC to reply.

MR. TREMBLAY: Pierre Tremblay for the record, the -- the emergency planning and offset actions and so forth, while it's the responsibility of the province to establish the plan and there is a plan and I keep reiterating that point. We -- we work with both the -- the province and the municipalities around enhancing that plan and we have a tremendous amount of input and I guess what I would say is we've certainly heard the concerns around transparency and information and knowing what to do and so on and so, in order to go back and look at that to see what we -- what we need to do to enhance the overall plan and there are many vehicles to do that.

Furthermore, through the lessons from Fukushima, that's put obviously a sharp focus on that specific elements and those are being worked on. Perhaps I might just ask Jim Coles, our director of emergency planning, to talk a little bit about the forms that, the opportunities that we have but not to put too fine a point on it, we certainly recognize and we've been listening to the intervenors and -- and the issues that they've raised and clearly we know the people that are accountable and we can help and support them and we will do so. But perhaps Jim, you could elaborate a bit on what we are doing.

MR. COLES: Thanks Pierre. Jim Coles for

the record, I would like to stress that we do have strong working relationships with the community and the emergency agencies, so we -- we do have regular working meetings at least on a quarterly basis where we discuss the details around the integration of our emergency plans. So we'll use those as opportunities to have the dialogue.

For instance, we have made recent improvements around the station around our notification capability, the public alerting systems that Clarington has put in in past years and we do have prompt notification capability. In any emergency we'll notify in about 15 -- within 15 minutes of emergency, but clearly there's opportunities to continue that discussion further.

MEMBER BARRIAULT: Thank you. I'd like to ask CNSC if there would be a mechanism whereby you could monitor what's going to happen with emergency response not just within the plant site but outside the plant site. I think as in a lot of issues where, you know, provincial jurisdiction's involved we seem to delegate and assume that it's being done but is there any way we can make sure that it is being done and done well, I guess, is what I'm looking at. We've seen that over the last few years with occupational health for example, so maybe we could look at something to do this. I don't know if that's feasible or not.

MR. JAMMAL: Ramzi Jammal for the record.

Of course, the updates and improvements to emergency management and planning and the programs itself is one of the action items arising from Fukushima and the word came before you the commission ordered to endorse and approve the action-endorsed plan. The action items apply to all licensees to include Darlington and I will pass the detail on to Mr. Luc Sigouin, but EMO has indicated that they will be working on integration in addition to the action items, we recommend proposed not just the program itself, is the implementation of the program through exercise and so on and so forth, so that's part of the licence condition that's currently in place and the integration of the offsite even though it's multi-jurisdiction. We're going to monitor to ensure that there is integration.

And then we'll be before you, I believe, once or twice from Fukushima update with respect to how the progress is being made. I will pass it on to Mr. Luc Segouin.

MR. SIGOUIN: Thank you. Luc Segouin for the record. I'll just backtrack a little bit and talk about OPG and the links with EMO and then I'll come back to -- to your question, Dr. Barriault.

So, you know, CNSC has a very good oversight process of the licensees emergency preparedness

and we over the years have verified and you've seen in the reports that -- in the annual reports where they're rated as fully satisfactory for emergency preparedness. They have a very close interaction with EMO and we're confident that the processes that they have in place, that there's good interaction, good connectivity with them. And that as we have seen is exercised on a regular basis.

I think what we've heard from intervenors is they'd like more information on that. In regards to oversight of the -- of the EMO's emergency plans, we've always had some level of oversight, you know, for instance, the fire chief of Clarington who's here, is interviewed by our emergency preparedness specialist on a regular basis to see if he's getting the support that Clarington fire department needs from OPG. We've interviewed the school boards in the Pickering area, but what we've heard now is that maybe there should be additional oversight and we will certainly take that into consideration and have some discussions with EMO about how we might be able to do that more in a more fulsome manner.

THE CHAIRMAN: I'd like to be really very precise about what is that we are asking. Is it reasonable to expect that by 2014 at the latest there will be a full description of what happen in an emergency, in a nuclear emergency? And Mr. Jammal you just let the cat

out of the bag. You mentioned core meltdown 10 to the minus 8. I expect now everybody say, well, what's the emergency plan for 10 to the minus 8 now and what I'm trying to understand is what is reasonably to expect available and you know, on presented a 2014 that address some of the issues that were described there?

MR. JAMMAL: I'll start. Ramzi Jammal for the record and I'll pass it on to Luc again. We're looking at two things. We're looking at onsite and offsite. On the onsite we have to have enhancement in place. That's -- that's -- and the challenge I believe is going to be the integration between municipality, province and the operators. So to make sure there's a seamless from decision making. So Dr. Barriault's question is already going to have an oversight. We quote-unquote 'legally' we don't have protective oversight but we're going to be on their toes in order to make sure that everything is integrated in a matter to the satisfaction of the Commission.

THE CHAIRMAN: I'm not accepting that we don't have it legally.

MR. JAMMAL: Well ---

THE CHAIRMAN: --- because you know -- you know me on that. So I don't want to get into a big debate because of the Province EMO is on -- you know, on the same

page.

But to have something that -- a brochure will come out in the day when we talk about nuclear -- without mentioning nuclear -- and by the way, I didn't read this 22 page brochure. It doesn't leave me comfortable for Mr. Ciuciura knows us, knows us very, very well.

And for him to come up with this document without any nuclear -- and again, maybe I'm -- maybe I should read the document. Maybe -- maybe I don't understand what document papers is.

MR. JAMMAL: Okay. We can talk about document, I'll pass on to Luc, unfortunately I don't know if the EMO is on side. But the point here is the integration is a requirement, okay. And the action is going to be on -- on -- I know OPG is not going to like it on the licensee in order that integration takes place.

MEMBER BARRIAULT: Now, you suddenly heard -- I heard today about this intervenor mentioning the fact that there are some communities that do not have alarms or sirens for real estate reasons. I mean, is this correct, or is that just ---

MR. JAMMAL: I have to ask to Mr. Sigouin, because they have to be in compliance with requirements of the EMO, the updated provincial ---

THE CHAIRMAN: Sorry to interrupt, but I've just been told it's EMO and the Durham Emergency Management are online.

MR. JAMMAL: Great. That's -- Thank you.

THE CHAIRMAN: Is he -- let me start with the Durham. Is the Durham office on?

SGT. CIUCIURA: Yes, it's Sgt. Ciuciura. I'm the Director of Emergency Management for Durham Region. Can you hear me okay?

THE CHAIRMAN: Yes, we can.

SGT. CIUCIURA: Thank you.

THE CHAIRMAN: So I don't know if you heard, but there was a lot of angst expressed by your document that was released this week or this day or today. Many of the intervenors said that they got it in the mail and it's supposed to deal with emergency management.

And they were absolutely stunned that there was no mention of nuclear in that document. That's what they said publicly here. What do you say to that?

SGT. CIUCIURA: Ivan Ciuciura, if I can answer that. The intent of that brochure is a general brochure on what to do in emergencies. And it gives the general guidelines that the three main categories of risk in the region are weather related.

Some hazardous material type of release and

that exaggerated event. It doesn't go -- it doesn't intend to go through what exactly to do with a flood, what exactly to do with a snowstorm, what exactly to do if it's an emergency. So it wasn't -- it's a general one for an individual to prepare for any emergency.

And I did mention when I was there before the Commission that it does cover the two -- two actions that we want to see from the public. And one is, "If you are directed to shelter," and it tells them how to do that. The other one is the, "You are directed to evacuate," and it tells them how to do that.

Again, that's for any emergency. And yes, there isn't a mention of nuclear. We do have a separate nuclear public safety brochure. And that one, I have not -- it's just been -- actually, we've just overhauled it, make it a different look. That one, we are considering.

I don't hand it out to everybody. And it's available on our website. You can look at it now. But it is available on and you can pass it out to municipal offices and that type of thing. You know, and we are considering what if that needs to be sent out to the 10 kilometre zone.

Where we're coming from from a nuclear too is I have to look at overall risk. In 2002, I had a

consulting company do a risk analysis for us. Out of 32 categories of events, nuclear in their accounting came out at 32 out of 33 I believe it was.

So near the bottom of the list in terms of probability. So it's -- how much focus do you put on it? Obviously we do still do a lot. It's near the bottom. I don't -- I don't go with that. It takes -- nuclear takes about 50 percent of my work plan.

Can we do a better job? And that's what I like to hear from, you know, if people have the brochure, we're seeking comments. We've had some telephone calls commenting that they -- they are happy with the brochure.

So anyways, back to that brochure. It is a general purpose one. It wasn't specifically nuclear. Nuclear wasn't mentioned. We do have a specific nuclear public safety one.

THE CHAIRMAN: Well let me give you a couple of points on this. Even if you mention in that brochure that there is another brochure that describes the nuclear emergency plan, I think that will have been good.

This is the region where nuclear lives. And it's absolutely unacceptable to me that there is no such document on any time you mention emergency, nuclear should be in it.

And now I'd like to turn to EMO and ask

what's your view -- the dilemma we always having here is because it's such a low probability of event, you guys ignoring it. Everybody ignoring it. Yet the citizen, even though it's a low probability event, that's the most fearful event.

So you've got to bridge those two conflicting issues. Low, low frequency, but maybe high impact, and you've got to deal with it in all your brochures. That would be my view.

And last but not least, we are the nuclear regulators. So we're gonna be so in your side here to make sure that all the citizen of this community are aware of what to do with emergency plan.

SGT. CIUCIURA: It's, Ivan Ciuciura again. Dr. Binder, I welcome any input from the CNSC and always will. And I will always come before the CNSC and provide any information I need. So I do welcome the comments.

And just a comment that then as you go back to Mayor Foster's one. We -- it -- and my comments earlier. Yes, we do have a responsibility to get word out. That's public -- that's one of my biggest challenges is public education.

I take your comments seriously on the brochures. We do have a second brochure and then -- and I will be, you know, looking at sending that out to

everybody so we do get the word out.

But if you remember Mayor Foster said it doesn't -- he's not getting a groundswell of public opposition through nuclear. There are concerned citizens. There are intervenors that haven't touched base at all with my office on what plans we have available or what's there.

So I can't speak to that, I suppose, but -- but oversight by CNSC or if they're going to be my hip pocket of suggestions, I'm certainly open to all that.

THE CHAIRMAN: Okay, thank you. EMO, would you like to comment?

MR. KONTRA: Thank you, Dr. Binder. Tom Kontra for Emergency Management Ontario. As I understand it, there are a couple of issues. The first question was tightening up nuclear response. Then I heard that we may be ignoring the nuclear issue. And then there was something about integration.

So let me first of all say right from the top that Ontario is far from ignoring nuclear issue. In fact, we found it so important that our nuclear plan is the only plan that is taken to Cabinet for approval. So if anybody thinks that we're not serious about nuclear, they're particularly wrong.

The tightening up aspect, the plan calls

for and is practiced every time there's an event as to a 15 minute notification by the facility -- any one of the five facilities that we look after, of a categorized or a notifiable event. And it doesn't matter what the level is. The lowest level is 15 minutes as well.

And within 15 minutes of receiving that at the Province, we provide off site response. Just so that we don't waste any of this time, plant notification also goes to the affected community, to the designated community. So there's no chance of the Province missing the beat and Durham not getting the event.

We do have redundancies in emergency management throughout our organization, whatever the event, whether we're dealing with nuclear or otherwise.

The integration that has been used, I think our plan says conformity. And we do have that, as you know from other hearings that we've had on other topics that we are very close to a perfect record on there. There are a couple of minor things that we're working on. So conformity, tight response, and particular attention to nuclear I think we're clear on all three of those.

THE CHAIRMAN: Thank you for that. That's very helpful. The only concern we were expressing here, now that there was a brand new brochure circulated to all households within I think the 10-kilometre radius, and it

didn't mention -- about the emergency management, and it didn't mention nuclear.

That was some of the intervention that we heard today that was a bit surprising to us. And we would like to see eventually a similar kind of a brochure that is specific to nuclear disseminated to the public and I'm not sure what's the best way of doing it. This is something that I'd like to be seen resolved by 2014.

Mr. Jammal.

MR. KONTRA: Again, it's Tom Kontra, sir.

I think that's a reasonable concern and question that we are quite prepared to take to our Provincial Nuclear Emergency Management Coordination Committee to discuss what the various designated municipalities, the host municipalities, and the facilities, all of which participate on that provincial committee. And we can see how that could be applied in not only this area but the other nuclear jurisdictions.

THE CHAIRMAN: That sounds good. That sounds very, very promising.

Mr. Jammal?

MR. JAMMAL: It's Ramzi Jammal for the record. Thank you, Mr. President. I hear you clearly, and this is a direction from you as a Commission to us in order to ensure the response. The integration or

conformity is being looked at and we'll be reporting to you on -- like I mentioned, under the Fukushima Action item or if there are any delays, we'll be reporting to directly the Commission with respect to non-conformity or any lapse or deficiencies that we find.

THE CHAIRMAN: Okay. Thank you.

Ms. Velshi?

MR. CIUCIURA: Dr. Binder, it's Ivan Ciuciura, from Durham Region again. May I just have one more comment, and it's regarding again the response. And I think that was brought up earlier, not just the brochure, and I would like to echo Mr. Kontra's point that there is a system and it works well and it's exercised well. That 15 minute -- it was yesterday we had a reportable event at Picketing. And within 15 minutes, it's clear that the plant notifies us in Durham Region and DEMO. And within 15 minutes, DEMO gives us the off site response and that's passed to the local community.

I'm confident that that process is clear. It's in place. It's been practised, and it does work. So I just don't want to leave it that there's any -- I don't want to leave you with there's something on that side, I think, that needs to be tied up or by 2014, it needs to be enhanced, then we can always be looked at and it always is after every incident.

But it's clear on our side how it's to work on the off site response.

THE CHAIRMAN: That's very good and very reassuring. The question was whether the public at large is aware of some of those details, and I think that's -- we're talking about the communication angle of all of this, and I think that we will try to work together at all levels, including by the way the federal level that we've never even mentioned in the last two days or so, to deal with a severe accident should such an accident happen in the nuclear space.

I think we need to move on and so Ms. Velshi?

MEMBER VELSHI: My question, and it's more on clarification, is to CNSC staff and it's on the whole area of environmental monitoring. We heard a lot of angst and numerous, numerous concerns expressed around the lack of transparency about what gets measured by whom and where is that information available.

And I know Dr. Thompson, you did say that you would take the action of coordinating perhaps the various agencies whether it was Health Canada, Ministry of Labour, OPG or whoever. And I wanted to get a sense of exactly what would the end result of that be because I think ideally, what we want is one place where one gets a

full picture of exactly who is doing what, and the public getting access to what the results are of -- and as they ask real time monitoring results.

So to get a sense from you on timeline and is that the kind of end product that you envisage from that exercise?

DR. THOMPSON: Patsy Thompson for the record.

The plan we have has been launched. The CNSC has upgraded our laboratory. We now have the capability to monitor all kinds of environmental media for very low levels of radiation, which was one of the issues we had before, and we have upgraded as well the number of staff and the expertise in our staff.

And so moving forward, we have put in place what we've called an independent environmental monitoring program. The design of that program has been developed based on information we have on our facilities in terms of the types of emissions they have, the environmental compartments that will be affected. And this year, we're in a pilot phase where we've identified a number of facilities that we are monitoring to make sure that we iron out all the bugs.

In parallel, we've contacted Health Canada, the Ministry of Labour, and we've also talked to the NPP

operators. And the plan is to have on the CNSC website -- a place on our website where all the monitoring information will be, and we've had requests from various groups to have the detailed monitoring results. But also our plan is to have the details sort of as -- the first layer would be an interpretation of the results in terms of what it means to people. And then, if people wanted to have more details and the exact individual results, then they'd be able to have access to that as well.

And that phase is scheduled, if my memory is right, for September 2013. And so until this fiscal year, we're doing the pilot project with a plan to readjust our plans and launch the full independent environmental monitoring program, starting April 1 of 2013.

THE CHAIRMAN: Thank you. Mr. Tolgyesi.

MEMBER TOLGYESI: Maybe I will have one to OPG that there were some questions in OPG's safety culture.

According to what you were saying on this subject, OPG is proceeding on a continuous basis, surveys and evaluations on this subject, which seems to have a positive conclusion, is what you were saying.

It seems also that posting general conclusions of a third party review on the progress of

this -- on this subject, will be welcomed by citizens.

Do you see any potential opportunity to publish that? I'm talking about general conclusions, not necessarily, you know -- because it's a kind of complete and complex report.

MR. TREMBLAY: Pierre Tremblay for the record. Not to revisit all the aspects of human performance and safety culture, we do have access to the community through a number of mechanisms.

One of the principal ones is through our Community Advisory Committee and Council. There's local press involved with those discussions. And so perhaps one of the thoughts for us is to use that forum to talk a bit about the safety culture.

In addition, we present ourselves to Council on a regular basis the local community to talk about the results of the power plant and to the extent that we can be more visible around the attitudes and views of the employees, we will endeavour to put that in there. It may already be there. And perhaps I might just ask Brian Duncan, but I think we provide a fairly fulsome review and leave ourselves open to any questions that the community might have.

We also discuss our results through a -- I believe it's a quarterly publication out to the community

on the affairs and the results of the Darlington plant, and there's another vehicle to drive that transparent same discussion.

MEMBER TOLGYESI: Why I'm saying this is because, you know, I think you are very close to the community around the operation. But what we were hearing today it was several intervenors from a large great Toronto area and it was going as far as the First Nations on the other side, close to Hamilton.

So I think they have some concerns and they have some questions, and I don't have a recipe or idea how to reach them. But probably it's something that could -- you should think about because you were talking about 10, 20 and 30 kilometres in recreation zone and, you know, they fall in this area.

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

Certainly, we have a website. The company has a website as well. And we do communicate to Ontarians more broadly, you know, in that regard. But I appreciate the input, and certainly a public session like this where a lot of information is exchanged and issues surface, it is our nature to go back and reflect on what we've heard and look to make adjustments.

You know, really what you're talking about

here are the attitudes and the views of our employees, something that we -- that matters very, very much to us and we monitor that and we look at that, we hold ourselves to account.

But fair enough, we'll certainly go back and reflect on this. Thank you for the input.

MEMBER McDILL: Thank you. My question is one I would have asked way, way back on Monday but we were sticking with general questions. In your document H13-1A, under challenges you identify three zebra mussels fuel reliability in chemistry. I think you covered the zebra mussels in the last few days. But there has been no update, that I'm aware of, on the AECL Chalk River Laboratories inspection or post-irradiation examination of fuel, and also with respect to the chemistry issues in the -- well, the Figure 6 on that, and also in 3.3.4.

MR. TREMBLAY: Pierre Tremblay, for the record.

That's really something for Brian Duncan to talk to, so I'll let Brian do that.

MR. DUNCAN: Thanks very much, Pierre. Brian Duncan, for the record.

Let's tackle fuel reliability first. The post-irradiation examinations have not been completed. Of course we did the in-bay examinations. Our conclusion's

from the examinations, which is just likely foreign material, is the cause of some of the issue.

We believe, and we have worked very closely with the fuel manufacturer to look at where that may have occurred. We do know that we had a batch, if you will, where there were four to five events that came -- were manufactured roughly at the same time.

And what we've done now is we're working with the fuel manufacturer to look at their manufacturing processes, their foreign material exclusion processes, and we're sharing with them what we've been able to do in our power plant and what we've developed, with help from the industry, around FME prevention and to better improve the overall performance, if you will, at the manufacturing end.

Having said that, though, you know, that's where the early evidence points to. We will complete those post-irradiation examinations to confirm that there's not another cause there. But today we are running defect free in all four cores and we have been now for about six months.

In the area of chemistry, chemistry and overall chemistry performance is something we monitor very closely and we have an aggressive improvement plan there.

Largely the challenges with chemistry have

been in two areas. It was feedwater hydrazine control, and we believe we have the solution for that, and we have solid evidence now to show that we have a much better -- we're getting much better performance out of the equipment we have and we're enhancing that equipment further. So we're going to be able to control our -- what we think is the acceptable tolerance for that chemical in the feedwater to a much tighter level and keep it where it needs to be.

The other area of challenge has been corrosion product transport after outages. And we've looked at that, we've talked to the industry, and we did a couple of simple things at our station to help improve that performance. One was we're testing a new product, morpholine, in the feedwater, and that's showing great promise. We did a trial run on Unit 3. The results from that were very, very good. And we intend to extend morpholine use to all of the units by the end of next year.

And the other thing we did was something we picked up south of the border, where quite simply in outages they would go in and they would sweep out the condensers -- manually sweep out the condensers to take any loose material or any oxidation out before restart. And that gave us a five-fold reduction in total integrated

duration of corrosion product transport burst after a restart, which was very, very helpful to us.

So we see both of those areas. It's not something I'm going to stop tracking. It's important. But we're getting the results we need, both through the use of new chemicals, the use of simple processes in outages, and we think we're going to get our chemistry performance right where we need it to be. And if you looked at the chemistry performance today it's actually at the standard for -- at the standard of excellence.

MEMBER MCDILL: Thank you. And staff is satisfied that these will be in hand if the renewal is given?

MR. WEBSTER: It's Phil Webster, for the record.

Yes, staff does monitor OPG's performance with the zebra mussels. The main concern to us of late has been what's described on page 15 regarding fouling to the oil cooler and the shutdown cooling pump motors. This is mainly an economic problem, in that it can cause difficulty entering an outage, but there is still a heat sink via the steam generators. But we are keeping careful watch on what OPG's doing.

MEMBER MCDILL: And also with fuel and chemistry?

MR. WEBSTER: That's correct.

MEMBER McDILL: Thank you, Mr. Chair.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Merci monsieur le president.

I want to come back to the aging management plan for containment structures. I know we have touched that point and Mr. Elliott gave me some answers. But it's more a general because there is many items in the containment structure, not only the concrete containment structure.

And the second paragraph from the bottom of page 25, it's very important because I can read there:

"NOP managed to show that based on the current rate of aging the currently installed NOP trip set point support the acceptability..."

So it's very important too. And my question is because in the third paragraph from the top, the last sentence:

"The final leak rate test results from the 209 VBO confirmed that the vacuum structure was leak tight and the leakage rate was within the..."

So it's very difficult for me to have a --

and I even -- and as it is used to determine the rate of aging and the trip set point, I would like to have some clarification to how you get to that rate of aging and that support the trip set point.

MR. TREMBLAY: Pierre Tremblay, for the record.

I'll ask Mark Elliott to elaborate. But the fundamentals here is that, you know, the systems are all tested with a certain periodicity and, you know, this -- and I guess we use a lot of acronyms in this business but ---

MEMBER HARVEY: Yes.

MR. TREMBLAY: But SOE stands for safe operating envelope.

MEMBER HARVEY: VBO, SOE.

MR. TREMBLAY: And vacuum building outage is the VBO.

But, you know, the essence of it, we're looking for degradation; we're looking for, you know, systems performance over time, and if we see any degradation than clearly we go investigate further and determine what actions, if any, are necessary.

But I'll let Mark elaborate perhaps on a few ---

MEMBER HARVEY: Because my -- the essence

of my question and my concern is because it's like you were adding many different items and pressure tubes and steam generator and tubes and concrete containment.

MR. TREMBLAY: Appreciate it -- Pierre Tremblay, for the record -- that there are many components. The CANDU system is made up of many interconnected systems and an entry like this talks about some of the perhaps the more significant issues.

But again, let me ask Mark to elaborate a bit on some of the details.

MR. ELLIOTT: Mark Elliott, for the record.

You mentioned two different items, one on containment one on NOP. So I'll do the containment first.

For containment, I think you asked, you know, what are the various components and are they all looked at, and the answer is that the components are the concrete, and we've talked about concrete and the fact that we -- how we test it, and that we've seen no degradation yet. And that we also do a leak rate test during vacuum building outages and we've seen good performance there.

So the other components that aren't concrete are on the penetrations where cables and pipes go through the containment from one side of containment to the other. Those equipment penetrations are checked as

well. And we also check and there's certain seals that are elastomeric seals that are part of the containment structure that we check as well when we can get in during vacuum building outages.

So all the components that could make up the containment boundary are tested on a periodic basis to make sure they're not aging and not deteriorating. And so far performance has been quite good, and that's what we're trying to say in that paragraph, that's containment.

Down below on that same page it talks about NOP that's neutron over power, and that's one that's been to the Commission many times. The latest information on that is that last -- last spring, we got an interim approval -- an interim acceptance of our methodology to address this and the reactors are running at 100 per cent power today. Committed to you in next year is complete review of that by CNSC staff to bring that kind of a final approval of the methodology. And so that's one aspect.

The other aspect is the -- we're putting new fuel bundles in. We're putting this new design fuel bundle -- 37M we call it -- and that addresses the aging as well. It's -- so it's better analysis and I think you've seen that a number of times, and a new fuel bundle that we've installed. And you'll see a -- the CNSC will be seeing a submission on how that affects aging very

soon.

So there's two aspects of that to address the aging problem. And those are all on track on schedule.

MEMBER HARVEY: Okay. Are all these elements part of the robustness analysis or it's something else?

MR. ELLIOTT: I would call that part of our aging management. The robustness we call -- in some of the more severe accidents where we're bringing up that term.

MEMBER HARVEY: Okay.

THE CHAIRMAN: Okay. We went through one round, and I'd just like to at least see if I can understand. You're looking at a licence extension for two years basically, so it's more of the status quo operation going for two more years.

MR. TREMBLAY: Pierre Tremblay, for the record. That's correct. And you know, that will enable us to complete the ISR, and the necessary work around the scope of the refurbishment and then essentially seek a licence for the duration, for about a 10-year time period.

THE CHAIRMAN: So during those two years -- and again, we'll get -- we'll start mixing the EA issues with the refurbishment application coming up, and in the

meantime, you're changing some of the fuel design, et cetera. What I'm trying to understand is what will be coming, what will make sense, assuming the EA is kind of a -- get the green light there. What is that you're going to have presented new in 2014 because you're not going to get the refurbishment all at once -- there're going to be there with refurbishment at the time -- I'm just trying to -- I'm just worried -- I'm just asking whether we're getting into the aging issue beyond 2014?

MR. TREMBLAY: Pierre Tremblay, for the record. Many of the issues -- in the issues that we've talked about in the last round of questioning are really near and present issues associated with a licence and they're appropriate for discussion here around the renewal of the licence of the plant. The ISR's a piece of work around -- really looking longer term, for the duration of the plant operation and the condition assessments around essentially what components get replaced and so forth. This extension simply allows us to complete that work and seek a longer term licence.

And you know, we've talked to the staff and have discussed with the staff basically, the approach that's to be used and this is it. So this is really -- the licence renewal is really simply asking for an extension of the current licence, looking at the operation

of the plant and essentially looking for that extension in an operating licence given that the current licence will expire early next year.

So that's really what we're talking about in this component of the review.

THE CHAIRMAN: Okay, thank you. I don't know if you are commissioners want to go through another round, or do you want to go to the Waste Management? Dr. McDill? Or let's go into the order. You want to -- you have another question?

MEMBER HARVEY: I was talking of robustness analysis, but in the CMD -- staff CMD on page 32 -- about the robustness analysis, an update would be provided in supplemental C and D prior to November hearing. Has that been produced?

THE CHAIRMAN: Okay, start again. Where are we? 32?

MEMBER HARVEY: Page 32, CMD 15 -- H15 -- top of the page, second sentence.

MR. RZENTKOWSKI: We reported on the robustness analysis because this is the -- this analysis is in progress. As the results of the lessons learned from Fukushima, we decided to re-evaluate risk associated with explosion on the site -- in particular, airplane crash into the containment.

And in order to reanalyze the safety case presented to us in about 2006 by the industry, we will use very modern forcing functions. It will be a very similar approach to that which is generally applied to analysis of accidents. So that means we have one forcing function for the design basis and the second forcing function for the beyond design basis. This analysis is in progress, and our assessment and conclusions are supposed to be finalized by the end of 2013.

MEMBER HARVEY: On page 31, the bottom of page 31, OPG submission is currently under review.

MR. RZENTKOWSKI: That's what I mentioned. Also, the submission from 2006 that were later revised in accordance with the comments received from the CNSC and submitted to us again. However, because of the lessons learned from Fukushima, we want to use modern forcing functions which will clearly describe a separate approach for design basis and a separate approach for the beyond design basis.

MEMBER HARVEY: But why -- why this has been prepared recently, and you mention an update would be provided. This is the update, what you are saying?

MR. RZENTKOWSKI: Yes, this is the update because this work is still in progress. And how I indicated, the overall assessment is supposed to be

finalized by December of 2013. We are not in a position to report today on the results of this assessment -- simply, it's protected to a large extent and also our review is still in progress.

MEMBER HARVEY: Thank you.

THE CHAIRMAN: Dr. Barriault? Velshi? Tolgyesi? Mr. Tolgyesi? Where are we? Okay. Dr. McDill?

MEMBER McDILL: My next one's on the Waste.

THE CHAIRMAN: We're changing books. Oh, okay. You're right. It's in the same book.

Okay, M. Harvey?

MEMBER HARVEY: Merci, Monsieur le Président. Page 19 of H14 -- Reporting and Trending. "CNSC staff also regularly conducts compliance promotion meetings with OPG which are pretty important to two way discussions on both in CNSC and OPG's activities". I would like to know who participates in such meetings. Is it only the employees on the site, or it's larger than that? This is the first part of my question.

MS. JONES: Pamela Jones, Senior Project Officer, Waste and Decommissioning Division. As part of our Type two compliance inspections, we include pre and post inspection meetings. Also as part of our compliance inspections, we invite other agencies to participate, such

as Environment Canada, Ministry of Labour -- both those agencies have participated in those inspections.

So everyone who has participated in the inspection from CNSC side and from OPG side is typically at the table for these inspections. We go over the details of the inspection and any ongoing licencing or upcoming projects to be discussed from either the CNSC side or the licensee side.

MEMBER HARVEY: Thank you. Other part of my question is about the local staff office. The -- are the employees of these offices very stable or there is a kind of a regular change? Well, I'm just talking about that to see if they are there for a period of 20 years -- what is the difference between the OPG employees and the other after 20 years; there's some proximity -- some time ---

MR. WEBSTER: It's Phil Webster for the record.

At the Darlington Site we have six site inspectors, one supervisor and one admin assistant. I think the admin assistant is the most experienced person on the site. The site supervisor has many years with the CNSC, working at both the Pickering and the Darlington sites.

With that exception, the inspectors are all

quite new. I think the next longest serving is about five years. So we have really a very young bunch at the Darlington Site.

This does vary. The Pickering Office, for example, is primarily long serving employees and the other offices tend to be a mixture but we are trying to encourage hiring of younger people and bring them up through the ranks.

MEMBER HARVEY: So there is not an organized turnover in order that the -- after a certain number of years, you change, you go elsewhere? No rotation?

MR. WEBSTER: We have no official rotation policy but we are always acutely aware of the possibility of our site inspectors becoming too close to the licensee. This is one reason why they report to Ottawa because we are remote and we can look out for that.

MEMBER HARVEY: Thank you.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: No, I'm fine.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: Question for OPG and CMD 12-H14.1, page 25. This is on response to Fukushima event and future plans. OPG states that the accelerated processing rate of transferring used fuel from the beam to

the dry storage container aligns with international strategy to address lessons learned from Fukushima event.

So tell me what that means? That's the last sentence in that. Does that mean that the fuel won't be in the bay for at least 10 years?

MR. TREMBLAY: Pierre Tremblay for the record. I'll ask Terry Doran to speak to that point there.

MR. DORAN: Terry Doran for the record.

Thank you Pierre. The current reference is that the fuel remains in the bay for a minimum of ten years and that is the reference point.

We are looking, and a study currently underway, to look at a shorter term than that. So we've just begun the design analysis to determine an earlier period that we can look to remove fuel earlier but those discussions are very preliminary in terms of a plan forward. And we would be working and consult with the CNSC once we have that analysis available.

THE CHAIRMAN: Mr. Tolgyesi?

MEMBER TOLGYESI: Yes. According to the staff, I'm talking about Phase Array Ultrasonic Technology. I think we didn't -- I don't remember we were asking this but according to the Staff Submission, page 20 and OPG submission page 30 of 64, this technology allows

for a safer and more versatile inspection and does not require the radiological protection associated with the radiography.

Does it mean that no personnel measures are required anymore? And if so, what kind of protection is required?

MR. TREMBLAY: Pierre Tremblay for the record.

I'll ask Terry Doran to speak to that innovation.

MR. DORAN: Thank you Pierre. Just for the record, Phased Array Ultrasonic Detection is really an array of sound waves that are pulsed through the material into the weld zone and they're reflected back into the instrumentation to give an amplitude of the wave. By doing so, the reflection and depending on the geometric reflectors, will identify flaws in the material.

The advantage of this over radiography, it allows for a faster, safer and more versatile inspections. It doesn't require the radiological protection associated with radiography. It can be performed anywhere in the facility where there's sufficient space and access to a weld platform.

It's more efficient by significantly reducing our setup time and it obviously eliminates an

exposure hazard to this safe. So it has innumerable advantages over radiography.

MEMBER TOLGYESI: And where this technology be used in other power generation stations management facilities?

MR. TREMBLAY: Pierre Tremblay for the record.

Yeah, that's the -- absolutely. And it is currently being used elsewhere.

THE CHAIRMAN: Thank you. Dr. McDill?

MEMBER MCDILL: Thank you. I seem to have taken my finger out of the binder and therefore lost the page reference but I'll try to speak to it in general terms.

As you move to, I guess it's the M37 fuel, the slightly differently configured bundle, will that initiate changes at all in the DSCs and how they're handled and how the packaging is dealt with?

MR. TREMBLAY: Pierre Tremblay for the record.

Again, that's likely something for Terry Doran but basically the size of the bundle, the external size, has not changed. There's some modifications to the inner part, so making it smaller, but again, Terry, if you wouldn't mind.

MR. DORAN: Yeah, thanks Pierre.

For the record, as Pierre has said, the modified 37 bundle features a slight reduction in the central fuel element diameter, resulting in a reduction of the mass by about 0.4 percent. This minor change results in, really, no impact to our operations and the Safety Assessment has demonstrated that the 37M fuel is within our safety envelop.

MEMBER McDILL: And staff concurs?

MS. JONES: That's correct. Staff have reviewed those changes and they're -- and we concur with that.

MEMBER McDILL: Thank you. And although this is actually more for the renewal issue as opposed to the waste -- is a waste issue, you've gone to washing of some things like gloves and liners and booties to reduce volume. You did that about the same time that we had a visit to Chaulk River and ACL where they were abandoning washing of gloves and liners and booties.

Now I realize they're rural and have different sewage treatment facilities than you, but it was a perplexing thing to see that that should flip over. And I was wondering if anybody had any thoughts on that? I'll start with OPG and I'll ask that.

MR. TREMBLAY: Pierre Tremblay for the

record.

Really, our focus is on reducing the volume of waste that's generated. And so to the extent possible where it's practical to go to a reusable garment, this is what we're doing and we've had a fairly aggressive run at it.

If you look at our waste stream, that's really the key for us, is that source reduction and plastic suits and hoods and various things is an area of target that I've charged the organization to really focus on.

MEMBER McDILL: Anyone have any comment?

MR. ELDER: Peter Elder for the record.

I think ACL's decision was more driven by -
- rather than looking at waste management practices as actually lot of the difficulties they were having with their onsite sewage system.

MEMBER McDILL: That's fine, thank you.
That's what I assumed the answer was but I thought I would check. Thank you Mr. Chair.

THE CHAIRMAN: Mr. Harvey? Un autre question?

MEMBER HARVEY: A short one. It's 11 DWMF, Pressure Boundary Design, it's on page ---

THE CHAIRMAN: Sorry, sorry. Where are we?

MEMBER HARVEY: --- Page 23 of H14. That's bottom of the page. This might be an idiot question but anyway, in -- how come we are talking of pressure boundary in the DM -- DWMF? Pressure Boundary Design, this is the title.

MS. JONES: There are some systems in the Waste Management Facility that do have pressure boundary requirements such as the fire protection -- in the area of fire protection. So although this standard is applicable to CANDU and nuclear power plants, some of the elements of the standard do apply to...

MEMBER HARVEY: Now I know.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: No, I'm fine.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: A question for staff. Just clarify something for me. So if you turn to 12-H14, pages 17 and 23, it's more to understand how the trend gets determined. If I look on page 17, for trends for operating performance, it's over the licensing period. Each year it's been satisfactory. And until 2011, when it's full satisfactory and the trend is shown as no change or minor change.

But then when I turn to page 23, on the trend there for physical design, even though it's been

satisfactory every year over the licensing period, it still shows an improving trend. So how does that -- what the trends get determined if it's moved from satisfactory to fully satisfactory? Doesn't that mean it's improving?

MS. JONES: Pamela Jones, for the record.

In some cases CNSC staff has rated OPG's trend as constant, although the rating has changed from satisfactory to fully satisfactory.

And sometimes we have rated it as an increasing trend associated with this change. And this is due to staff's evaluation of OPG's performance in light of rating definitions and an internal normalization of how staff considers the change in performance, in specific, safety and control areas.

For example, factors that are considered include if reportable events occur; the significance of the safety and control area and of any identified gaps and deficiencies, OPG's response to address any identified gaps and deficiencies, and in relation to their response the timelines that they've proposed for corrective actions.

THE CHAIRMAN: Go ahead.

MEMBER BARRIAULT: I guess -- now you've got me confused. I thought that once you were fully satisfactory you couldn't go any better than that really,

that was the ultimate.

What you're saying is that you can keep improving after being fully satisfactory?

MR. HOWARD: Don Howard, for the record.

We always strive to improve, even if you're fully satisfactory. We always look at various areas and we always try to improve.

MEMBER BARRIAULT: So what I'm hearing is that you get more than 100 percent on your exam?

MR. HOWARD: We always try to do that, 105 is better.

MEMBER BARRIAULT: Thank you.

MEMBER McDILL: That is possible, Mr. Barriault; it's called bonus marks.

MR. ELDER: Just to -- I mean I guess it would be as -- Peter Elder, for the record.

Just going back in, is -- it's not saying that when you're fully satisfactory they're 100 percent; they may be at -- I want to use numeric but say they're an A, there's a range in there to go and we look at -- again, the data saying do they look like they're just holding that level or they are doing things that are actually improving the performance in those areas.

THE CHAIRMAN: But trending does normally indicate multi-year trend?

MR. ELDER: That's correct, yes.

THE CHAIRMAN: So if it were to be a multi-year and you see satisfactory, satisfactory, like 8, 9, 10, and then 2011 fully satisfactory, when is the -- so last year it would have been a trending up?

I'm trying to understand how this trending -- if you're telling me the subjective view of the last year performance that's a different kind of an assessment.

MR. ELDER: I guess we'll take the feedback on how we do this.

We thought that when we changed the rating it was obvious that the trend over the previous years was going up.

So the trending is more to say where you see a trend of fully satisfactory do we think they are maintaining that, do we think they are doing stuff to improve it.

THE CHAIRMAN: So the trend is only on the last year?

MR. ELDER: Yes, it's a short term of where -- yes, that's correct.

THE CHAIRMAN: So it's really -- it's really -- it lacks the year trend, rather than multi-year trend.

MR. ELDER: Right. Because the conclusion

is based on the current -- the current, the trend is for history as well.

THE CHAIRMAN: Okay.

Mr. Tolgyesi?

MEMBER TOLGYESI: Yes.

It concerns aging. To what extent concrete aging may, will impact dry storage containers? Because there is a -- it's a thick concrete layer so...

MR. TREMBLAY: Yeah, I'll let Terry Doran answer that question.

MR. DORAN: Terry Doran, for the record.

We have, as we discussed earlier, a very robust design with -- notionally around 20 inches of concrete bounded by steel, covered with an epoxy high quality painting.

Even having said that, we know that there are going to be residents in the facilities for a long period of time so we have inspections to make sure that we look at the undersides where they're in contact with concrete for any early indications.

We do inspections on the welds to assure ourselves we're not seeing any change in the quality.

As we mentioned earlier, we also have, as part of our continuous improvement, have instrumented a dry storage container that has corrosion monitoring, so

now that we can also monitor from the inside, and that's a fully instrumented loaded dry storage container.

So we're now starting to look at -- we mentioned earlier, as part of our aging management, the minimum design of the container is 50 years; we believe it will exceed 100. We want the evidence to demonstrate that and that's part of our ongoing aging management for the containers.

Lastly, as we've said, the build -- the dry storage containers are stored inside a building. Obviously that helps in the environmental conditions.

One of the concerns previously in any type of long-term monitoring is chlorides in air. We actually have chloride monitoring in the facilities as well to see if that could present any form of corrosion and the evidence has indicated that our facilities are in excellent shape in that regard.

So we want to make sure that we have a very robust long-term plan here and we've got the evidence to demonstrate it.

THE CHAIRMAN: Thank you.

Dr. McDill?

Monsieur Harvey?

MEMBER HARVEY: Just very short -- page 33 and 34. I'm just wondering why there is no numbers -- no

figures on the -- if we had an emission control, environment monitoring, estimated dose to public; it's just qualitative you say, it's okay, it's okay, it's okay. So...

MR. ELDER: Sorry, Peter Elder, for the record.

I think it's because for those numbers they actually do not -- it's a site-wide environmental monitoring program so it's for the nuclear generating station and the waste management facility. So it's a complete site one and they don't try to differentiate what component is coming from one versus the other.

MEMBER HARVEY: Anyway, that would be good. But okay, I understand.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: No, I'm fine.

MEMBER VELSHI: I have a question for OPG. On pages 21 and 22 of your CMD, and it's around audits. So on page 21 there's mention of an ISO 14001 audit plan for September 2012.

If you -- any results, findings to share from that?

MR. DORAN: Terry Doran, for the audit.

Yes, we are -- hold our own ISO 14001 and our own occupational health and safety 18001 programs for

our quality of our -- both environmental and occupational health and safety management systems.

Both of these were audited by an external third-party auditor and we were successfully re-accredited this year for both ISO standards.

So that's a testament we believe to our ongoing commitment, both to environmental as well as occupational health and safety.

MEMBER VELSHI: Thank you. Oh, sorry.

And then on page 22, on past performance, that paragraph you talk about an independent auditor on effectiveness -- I guess of your human performance program.

But it then very much gets into teams being formed without sharing what the findings of that audit were. Can you share those with us, please?

Do you see the section I'm referring to?

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

The -- when we implemented the OPG human performance plan -- this was the nuclear standard. So we sat together, human performance working group team and that team did their analysis but part of it is a face-to-face communication with staff.

And part of our oversight and review was

that the rigour, the quality, and the dissemination of that to all staff in our view, as a leadership team wasn't effective.

So we've reconstructed that team; we now have an executive oversight that the team reports to. I have my deputy vice-president now, chairs, the working team to ensure that it's focused on the human performance principles of observation and coaching, procedural use and adherence, and presence in the field.

And so what we need to do is get back to our staff -- very similar to what Mr. Duncan talked about, is engaging the staff, getting open and honest communication and then having full transparency to share what we hear from our staff so we can make the right improvements.

MEMBER VELSHI: Let me ask staff that. So when you did your review or assessment in that whole area of human performance management did you see similar issues?

MS. JONES: No we didn't and we didn't have the results of this report. That was developed during 2011. During our inspections we do talk to staff at all levels, in the field as well as during private meetings and we haven't come across any of the issues.

THE CHAIRMAN: Mr. Tolgyesi?

MEMBER TOLGYESI: No.

THE CHAIRMAN: Dr. McDill?

Anybody else has anything else?

Okay, I got three very quick ones; page 34, staff, the last bullet, 3926, Licence Commitment. This is implemented in the CSA Environmental Monitoring Program. A question: why would it take full implementation? I thought you already were in full implementation through December 31st, 2015? What is new here?

And staff, explain that too.

MS. SWAMI: Laurie Swami, for the record.

You see me looking around a little bit. I was just looking for the Director of Environment Programs for OPG.

THE CHAIRMAN: Okay. Maybe ---

MS. SWAMI: But I can generally say that the Program is a new standard that's been developed and there's a number of sampling programs that we need to implement as we go through that to fully implement this new standard.

So, there is a phase and approach to this and perhaps the CNSC has more to add, but it is a program that's been developed through the CSA and we're fully supportive of implementing this. But, there is analysis we have to do to fully design the program.

THE CHAIRMAN: But the way to read -- just so you know my concern -- it reads as if something new is happening and now I'm looking at the negative that nothing is being done in 2015 about radioactive as of the substance physical -- potential biological effects, bla bla bla -- which I assume is not too.

Go ahead, staff.

DR. THOMPSON: So -- So, Patsy Thompson, for the record.

Just to give a bit of information. There's currently a Radiological Environmental Monitoring Program that has been reviewed and approved by staff and is in place at OPG. They also do some monitoring, to me, the requirements of the Ministry of -- Ontario Ministry of the Environment under the MISA Program.

The CSA -- implementation of CSA 28.4 requires an integration of -- a review of the environmental effects, a review of, essentially, what needs to be monitored. So, there's a gap analysis that needs to be done so the current state, under non-integrative program, moving forward to having a monitoring program that is more aligned with environmental effects that cover now just radiation dose to humans, but the site-wide effects including what we've been talking about in terms of entrainment and impingement.

So, looking at all the impacts at the facilities and making sure that the Environmental Monitoring Program aligns with it, looking at the frequency of monitoring, what needs to be monitored, detection limits -- So, there's an overview, a review of the program that needs to be done.

OPG conducted a gap analysis, submitted a plan of action and we've accepted it.

But, in the interim, there is monitoring going on so that's just ---

THE CHAIRMAN: A thing that would be useful that normally when there's such a transition, you actually talk about the gap, the new, whether than leaving the impression that this is brand new kind of activity.

That's all I was trying to say.

I'd like to move to my second question. I'm always interested in the way we report to the IEA and, on page 44, on top of the page, this is on safeguard that you're implementing OD336, "Accounting and Reporting on Nuclear Material".

A transition period was granted to July 2012, so I assume that now things are humming, right? Implemented and everything is cool.

Yes? So please ---

MR. DORAN: Terry Doran, for the record.

Yes, this is fully implemented, fully.

THE CHAIRMAN: So, pretty soon we can send information to IEA online, right?

MR. DORAN: We do already.

THE CHAIRMAN: Last question.

That has always bothered me. Why are there no transportation, packaging and transport of nuclear substance applied in on-site transport?

MR. JAMMAL: Ramzi Jammal.

Let me clarify one thing. The equivalency is being applied with respect to the transport on-site. They do not require the certification approval nor the licence with respect to transport on the site itself. So, it doesn't go out once. It goes out to the public roads, to the public transport between consignee and so on and so forth, then the -- we apply the regulations outside the facility as such. However, the same rigor and the same equivalency is applied on-site.

So, I'm trying to say you're not shipping from a licensee to a licensee; it's a transport requirement between -- within the facility itself, from one point to the other.

THE CHAIRMAN: Again, maybe it's a matter of describing. What I wanted to see in there: that the safety requirements are the same. Maybe not the licence

certification, but the safety of the workers is the same thing as the safety for the public.

MR. ELDER: Peter Elder, for the record.

I mean, the CMD that says: "OPG provides equivalent degree of safety." It is in that -- like in the discussion, we do say it's equivalent in terms of safety to the workers and the public.

THE CHAIRMAN: The exact equivalency is not voluntary, it's actually ---

MR. ELDER: Sorry.

We inspect them, we ensure that -- with the design and everything else. So, it's -- it's -- it's clinically segmenting the requirement. When I say the requirements, is -- they do not need -- but from a safety perspective, from a design perspective, there's no compromise. It's been respected the same way as we do as if this package is going outside.

THE CHAIRMAN: Okay. Thank you.

I've heard it a couple of times mentioned, particularly in -- also in Bruce, where the transport is over larger distances.

MR. ELDER: Correct.

THE CHAIRMAN: I'll make sure that the health safety is ---

MR. ELDER: That's right. There is no

compromise. As a matter of fact, as was presented, some of the containers are approved to go outside the facility.

THE CHAIRMAN: Okay. Thank you.

Anybody has anything? A last question on this?

All right. We are going to move now to the EA.

Ready to go? Everybody okay to continue?

Okay to continue?

All right. So, Monsieur Harvey?

MEMBER HARVEY: It's about the physical effects on human health. It's on page 18 of the page 3.1, that's the CMD -- OPG CMD; 18, Second paragraph.

At the end of that paragraph, the second paragraph, written by OPG, the CNSC flag this as a residual effect and conclude that any such psychosocial effect would be minor in nature and not significant.

I would ask the staff to -- How can we get to such a sentence? Because there could be a few people, even if it's not catastrophic, if the sirens -- with the sirens, with the evacuation, and everything, how could we say that it would be minor in nature and not significant?

MR. McALLISTER: Andrew McAllister, for the record.

When we look at the totality of the

accident that was assessed and we rate a few key points that were made before, but we'll just revisit those to set the context. We are looking at a beyond design-basis type of accident in a one in a million frequency. It had a limited off-site release; you heard the term 5.7 millisieverts at one kilometre. Sheltering could be considered up to three kilometres.

What has been shown though is we did recognize that, as you point out, the psychosocial effects could exist. However, OPG in undertaking its community consultation on this matter noted a high degree of comfort with the station, living close to the station, its operations.

They also undertook post-Fukushima engagement and outreach activities. And those -- those observations were confirmed in that.

As well, there are actions, and we outline some of them in our screening report that OPG could take to mitigate such social -- psychosocial effects such as -- and again, I -- we're assessing it in the context of this accident that was assessed -- such as posting of the radiation monitoring results and those sorts of things like that.

And of course mitigating psychosocial effects wouldn't just extend to OPG. In the enactment of

the various emergency management plans, there's a lot of that transparency and getting that information out to the public at all levels of government, including the CNSC, that is meant to alleviate those concerns.

MS. THOMPSON: Patsy Thompson. If I could add, many of the intervenors commented this week that the licensee and the CNSC are always in agreement.

And it's clearly one area where we disagreed with OPG's assessment that this would not be a residual effect. Because all the international experience following accidents, regardless of seriousness, is that they do leave psychosocial impacts, and we wanted to recognize that in our report.

MEMBER HARVEY: Mr. Tremblay?

MR. TREMBLAY: I'm going to ask John Peters to speak to this.

MR. PETERS: John Peters, for the record. I don't disagree with anything that Patsy provided to you. I just want to make it clear that OPG did consider this issue carefully.

We were, as you were aware and you heard today through the consultation that we've had in this hearing, that there were lots of people who we had spoken to. We had a very robust outreach program in communicating with the community as we were doing the

environmental assessment.

And that outreach, everything from public attitude surveys to the newsletters that we reach out to workshops to open houses, the broad range of consultations we have at all levels in the community told us that people were very confident in this project, and they did not ask us the kinds of questions that you would expect if people were particularly concerned about a radiological effect that could not be managed in their community.

And so as a result of that, we actually made a different decision here than we had in Pickering. In the Pickering Environmental Assessment for Refurbishment, we did identify a minor residual effect and the potential for concerns around these psychosocial issues.

When we looked at this community and probed carefully, we got the message that people were confident that we had done the right work and they were informed. And we made a commitment in the CA to be very clear about that, right through the refurbishment project and on into continued operation.

We would not let them down. We would continue to be a good communicator, open and transparent on our work and our safety culture.

THE CHAIRMAN: So after the -- almost four

days of hearing now, are you still of that view? And if not, would you try to do something different in whatever hearing we'll have in 2014?

MS. SWAMI: Laurie Swami for the record. We certainly heard a lot of input from the presenters that came to this hearing. We certainly heard that in the Darlington Nuclear hearing as well.

And what we find is that a lot of people do come to these hearings and present their views on nuclear energy and their concerns with nuclear energy. What we often don't see, though, is the number of intervenors that will come forward with the other side, the confidence that we see.

Now we did see some community groups, and they did come forward. We have our Darlington Nuclear Community Advisory Council representative who came and talked to you about the positive and confidence that they had in our facility.

So we do have another community out there that perhaps is not as represented in this type of forum as you would see. And I think what we do is we confirm that through the Public Attitude Research studies that we do as part of environmental assessments.

So we go out looking for a more broad assessment than just the polling that's sort of a

voluntary polling system. So we do have other data that we use besides just the hearing process.

THE CHAIRMAN: I was asking whether it would have been worthwhile or whether anybody actually does polling when they have a major major project about the community around the project where you would actually do public polling and get some raw data about where we're hearing the majority or the minority here.

MS. SWAMI: Laurie Swami for the record. Actually we do do public attitude research polling. That information is provided in our technical support documents and I believe that Mr. McAlister referenced that when he was discussing the psychosocial effects. All of that is well documented in the process that we use.

So we don't simply rely on our community open houses as an example, which would be similar to this forum where people voluntarily come. People are busy. They don't want to spend the time necessarily. So a poll is a very effective way of doing it.

The other aspect of that is we do our polling for these major projects, and we do that routinely. We would also look to the polling that's done say for the Canadian Nuclear Association. They do polling. There's other polls out there. So there's a lot of polling going on in the communities.

THE CHAIRMAN: Sorry to belabour this, but was there a poll specifically asking whether the community seemed supportive of refurbishing Darlington?

MS. SWAMI: Laurie Swami for the record. I'm going to ask Donna Pawlowski to -- if you would like to know the specifics of the questions. I just don't have them in front of me.

And perhaps we can pull the specific questions that were asked. But they are all around this project, the feelings about this project and about OPG Darlington generally.

MS. PAWLOWSKI: Donna Pawlowski for Ontario Power Generation. We undertake public attitude research with respect to -- about 1,000 people were surveyed for the Darlington Refurbishment Environmental Assessment.

What we look for is the level of comfort that the community has with the existing station and whether they have any issues or concerns with the proposed refurbishment, and if so, would it affect their behaviour? Would they move away? Would they change what they do?

The results, as John and Laurie have mentioned, are documented in the socio-economic impact assessment and the actual survey results are in the appendix. And we show -- we see a high level of comfort with the existing operation at the station.

We see a high level of comfort with people's personal health and safety, and we see very little concern or issues with refurbishment project or with continued operations or with the additional storage facilities that would be housed at the Darlington Waste Management Facility.

So the overall results from the specific survey are a high level of comfort with the proposed refurbishment and continued operation.

I'll just add that the Canadian Nuclear Association 2012 research also surveyed the Ontario public and there's a high level of support for refurbishment in the Ontario public, and in fact a desire that we move a little bit faster on that project.

MR. McALLISTER: And just to close off the matter, as we've said throughout the hearings, this screening report is a synthesis of all that documentation that's out there. I think, you know, what Mr. Stensil was waving yesterday and other stuff, it's a synthesis of all of that.

And it's important and to get honed on a key number on page 71 of our screening report, we talk about, you know, in the local study area, you know, they have 90 percent are confident in the safety of existing Darlington Nuclear Site and its ongoing operation.

So, that's the kind of -- as a responsible authority, we certainly take great comfort in that. And it gives us confidence in the predictions that you're seeing in the environmental assessment report on that matter.

THE CHAIRMAN: Okay. Thank you. Dr. Barriault?

MEMBER BARRIAULT: I'm looking at document 12-H-13-A. The letter from the EMO ADM, Assistant Deputy Minister. And what I'm reading in this really is that they want us to -- or would like to have an evaluation done of a multi unit failure. Can you expand on that? What happened -- that was addressed to Mr. McAllister.

MR. McALLISTER: Andrew McAllister, for the record.

In the letter, the letter had two parts to it, if I can break it down. One was they reflected on their -- the Pickering experience where they had indicated a -- we're going to use numbers again, but a 10 to the minus 7 accident was considered in order to test emergency response, and as we had replied in the letter, that wasn't indeed the case.

Actually, the accident that was considered in Pickering, consistent with what had been done previously and consistent with this environmental

assessment was it was actually an accident in the frequency of one in a million, and that was largely the result of the probabilistic safety assessment that was done then, the maturity of that methodology now, the differences in the plants and those sorts of things.

The second part was they used that to give the context for, as you mentioned, these multi-unit reactor types of accidents and associated emergency planning, and they referenced the Fukushima task force specifically.

And what our response was saying was, you know, we hear you and it is actually being considered under the task force here or the action items that it's being considered under.

So to summarize, our approach was the same for Pickering, and perhaps it was just a misinterpretation by EMO.

And then secondly, on the multi-unit and the associated emergency planning, those are action items being done under the task force.

And once we explained that to them in the meeting that we had referred to we had with them in November, they were comfortable with that and they reiterated that to you during the course of these hearings.

MEMBER BARRIAULT: So what I'm hearing then, this was not done?

MR. McALLISTER: Pardon me?

MEMBER BARRIAULT: Was this done?

MR. McALLISTER: The multi-unit ---

MEMBER BARRIAULT: Yes.

MR. McALLISTER: For the purposes of this environmental assessment, no, it wasn't. It -- when we looked at the frequency of the one in a million in multi-reactor type of accident was not at that frequency.

MEMBER BARRIAULT: So what you're saying is that the recommendation that they made was not correct?

DR. THOMPSON: Patsy Thompson, for the record.

So just to try to re-explain, when EMO sort of said, you know, "For Pickering you did such" ---

MEMBER BARRIAULT: Yeah.

DR. THOMPSON: --- which is to the minus 7, "So why didn't you do it for Darlington?" Our response was, "Actually, for Pickering, we did not do to the minus 7. We did to the minus 6. This is what we did for Darlington as well." And then we said, "Your concerns about the other aspects are being dealt with in the Fukushima task force," which they had referenced.

MEMBER BARRIAULT: Okay. So to make a long

story short really, this was not done because you felt it didn't have to be done. Is that correct?

DR. THOMPSON: That's right. Minus 7 was not done at Pickering. It was not done at Darlington ---

MEMBER BARRIAULT: Okay.

DR. THOMPSON: --- because the practice has been to the minus 6. It's a beyond design basis accident, and it ---

MEMBER BARRIAULT: And what I'm hearing ---

DR. THOMPSON: ---- conforms with international standards.

MEMBER BARRIAULT: --- is that EMO is okay with that?

DR. THOMPSON: That's correct. Patsy Thompson, for the record.

EMO confirmed this week that they were comfortable with this approach.

MEMBER BARRIAULT: Is OPG comfortable with this, that there's a recommendation of EMO ---

MR. TREMBLAY: Pierre Tremblay, for the record.

Yeah, we concur with the position, yes.

THE CHAIRMAN: Okay. So I didn't really want to open it up again, but what will it take to do minus 7 -- 10 to the minus 7? So that's question number

one.

Question number two, forget about the -- if we were to forget about the minus 7 or minus 8 -- now that you mention minus 8, they'll want minus 8 -- evacuation of the primary zone, that's the 3? What's the primary zone? Is the primary zone three kilometres or 10 kilometres? Somebody remind me.

MS. SWAMI: Laurie Swami for the record.

That would be an evacuation in the 10-kilometre zone that you're referring to.

THE CHAIRMAN: Okay. So was that ever modelled in terms of a study of how you do the full evacuation of the primary zone? Forget about the statistics here. Do we have a plan for how do you do a full evacuation of the primary zone?

MR. McALLISTER: Andrew McAllister. Oh ---

MR. JAMMAL: You asked a question with respect to we did consider accidents of lower frequency, and those are being implemented and they will be implemented as part of the licensing of the 2014. So the mitigation measures will be the integral part of the IIP.

So let me go back to the original one; 10 to the minus 6 was done as for impact purposes. Then before this, OPG has done the PSAs without any mitigation measures in place, and they said, "Okay, this is what we

have to do as upgrades." And then they've done the analysis and the assessment based on the installation of the enhancement of the safety.

Then this became the -- with these increased safety measures in place, that's the release frequency that was taken.

Now we're moving now towards the licensing aspect, where you are taking now the severe accidents beyond the design basis, with the added enhancements into it. So hence, the frequency that's going to be considered under the ISR is way below -- one or two orders of magnitude below what was done under the impact of the EA.

I'll pass it on to Mr. Sigouin.

MR. SIGOUIN: Luc Sigouin, for the record.

Just to clarify and put some things into context, the EA has referred to this one in a million scenario that might lead to 5.7 millisieverts dose at one kilometre.

I think it's important to note that the existing emergency plans that are in place at OPG, at Durham and with EMO for the province address the possibility of accidents that are much more severe than that.

The plans address the possibility of evacuation up to a 10-kilometre zone and, in some extreme

cases, 20-kilometre zone. So that's far beyond the one kilometre impact zone that was considered in the EA.

THE CHAIRMAN: Okay. It's critical that I understand this. Is there a plan that shows how you evacuate 10 kilometres, 20 kilometres, et cetera, something I can read and tells me how to do this, as a citizen?

MR. SIGOUIN: Luc Sigouin, for the record.

In the Provincial Nuclear Emergency Plan there are sections that describe the provisions for evacuation. Our colleagues from EMO, I believe, are on the phone and they can provide more information.

THE CHAIRMAN: EMO, are you still with us?

MR. KONTRA: Yes, we are.

THE CHAIRMAN: Well, thank you for that. So I don't know if you're listening to this conversation. Is there such a thing that I can hold in my hand and read what happens if we have to evacuate 10 kilometres, 20 kilometres? How do we do this?

MR. KONTRA: I would not want to put it in your hands to read. The evacuation plan -- sorry, the offsite response, when necessary, will order evacuations and will use the particular zones that we have put on a map around the facility, whichever facility it is, and those zones go out beyond the 10 kilometres, so that we

can call for additional evacuations. We focus on the 10 kilometres at the moment, but we don't necessarily stop there.

If a device from the various monitoring organizations is that there is an effect beyond the 10 kilometres, then we would continue to do the evacuation beyond that perimeter.

THE CHAIRMAN: I know you've said it many times. It's just that why can't I sit down and have a document that describes this process to me?

MR. KONTRA: The process -- the basic process is there, but the basic process doesn't say you do this for this event at 10, for that event at 20, or in the third event at only two.

THE CHAIRMAN: Okay. Well, let me ask it differently. So I live near -- I don't know -- somewhere near the plant and an emergency occurs. Which shelter do I go to? Is that known *a priori*?

MR. KONTRA: Which shelter we send you towards will depend on the prevailing wind on the day of the incident. So that you could be sitting in your residence, and on the 5th of September, given the prevailing weather patterns and the accident that happened, I may send you towards Toronto. On a different day I may send you towards Peterborough.

THE CHAIRMAN: Right. But you have those shelters predetermined to absorb, let's say 250,000 people.

MR. KONTRA: No sir. There are no shelters to absorb 250,000 people. There is a process to move people out and to -- depending to on the number people then they get moved out further and further to achieve that amount.

The studies that we have indicate that for evacuating 250,000 people or any number of people for that matter, 20 percent will require sheltering. So out of 250,000 up to 50,000 may require sheltering. And we think that we have identified mechanisms to do that. We do not have 250,000 bed spaces sitting empty waiting for a nuclear event.

THE CHAIRMAN: Okay. Thank you. Ms. Velshi.

MEMBER VELSHI: So I'm going to add to the confusion. So for the EA purposes and we say the 10 to the minus six is an international standard that's been used. And that for the ISR, and for licensing there will be the ISR done and you know, these lower level much, much less frequent ones will have been assessed. But I guess for the EA purposes, to understand what's the impact on human health and all the other environmental effects, if

we were to look at the lower frequency one -- forget the emergency planning because that seems to be looked after, what would be the impact of having a lower frequency incident that results in significant external emissions?

And I -- and that's what everyone was grappling with and so what we saw from the stuff that Greenpeace was showing, that there are a couple of scenarios where you will have emissions. Yes it was less frequent than 10 to the minus six.

So I guess there's two questions, one is what is this international standard that is the 10 to the minus six? And secondly, if we were to look at something less frequent, what would be the environmental assessment of that?

THE CHAIRMAN: If you cannot resolve it now you know, we may have to resolve it a bit later on and get more information.

And my suggestion is one way of -- one way of resolving this is you actually take the OPG, the Greenpeace, two scenarios that they said that resulted in radiation release, let's not worry how we got there but there was a significant radiation -- that's all I'm saying; then what would be the impact?

There would be evacuation. There would be -- they claim there will be mortality and all this stuff.

We'll just have to take a look at this. And how do we deal with it?

DR. THOMPSON: Okay. Patsy Thompson for the record. Just so I'm clear and also to put it on the record. The 10 to the minus six corresponds to a safety goal for a new power reactor. So it is a modern standard. That's what the EA is based on.

Essentially what you're asking is if we look at the 10 to the minus seven or 10 to the minus eight category accidents that have been identified with the safety improvements in place, it's essentially, you know, taking the source term and modelling and looking at doses to members of the public depending on wind conditions. So that can be done.

It hasn't been done for the EA, but it's certainly something that is doable. It's -- you know, it's essentially -- the information exists to be able to do it.

THE CHAIRMAN: Okay. We -- I think --

DR. THOMPSON: But I guess, Mr. Jammal was reminding me that with the implementation of the Fukushima lessons learned, this is being dealt with essentially because the lessons learned -- the action plan is based on, not the frequency or the probability, but if an accident happens, what are the measures that need to be in

place? And the integration of the -- the enhancements to the emergency response will be done.

So it's being considered sort of in a different sphere.

MEMBER VELSHI: My only question on that part, because I know you've said that I how many times over the last few days that that is being done under that, will that also assess the health impact and the environmental impact? Or is it just here's what the emergency plan will be as a result of that?

DR. THOMPSON: Patsy Thompson for the record. It's certainly something that -- I know one of the issues this week is that, as you say we've said it, but we don't have any evidence of what the consequences would be.

And so it's certainly something that in relation to the Fukushima action plan that we can look at in terms of not just the emergency response plans but also give some information so that we have that reassurance.

THE CHAIRMAN: Okay. I'm told a break is in dire need. We'll take 15 minutes. Ten minutes. So we'll reconvene at 25 to six.

--- Upon recessing at 5:23 p.m. /

L'audience est suspendue à 17h23

--- Upon resuming at 5:41 p.m. /

L'audience est reprise à 17h41

THE CHAIRMAN: Okay. We're back. Where were we? Who was the last one asking the question?

DR. THOMPSON: Dr. Binder, if we could -- because I don't think we answered Ms. Velshi's question very well.

And so if -- what we -- given the, the flow in what's happened this week and the -- some of the questions and the last question that Ms. Velshi had, under the EA we've looked at the significant criteria and likelihood criteria and our recommendation document in the EA report is that there are no likely significant impacts.

But we've also recognized, and we've been sitting here all week as well, that there's a lot of public concern. I think people want to know what would happen and what would be the health consequences. And so recognizing that in the Fukushima lessons learned, the work that will be done under licensing for Fukushima lessons learned, I think it would be feasible to look at the improvements that will be put in place because of the Fukushima lessons learned, to do an assessment of the consequences, the health and environmental consequences of an accident under that framework.

And because of public concerns, what we would do is we would take that information and put it into a public friendly vehicle like an information document or something like that that would look at the consequences and explain them in terms of health effects and environmental effects.

And I think OPG had some additional information because there's been questions asked about whether there's a description somewhere of the emergency response plan. And I think they have that information.

MS. SWAMI: Laurie Swami for the record. So as part of the Darlington new nuclear environmental assessment, we filed a document, emergency planning and preparedness technical support document for that project which of course describes the same site that we have.

In that document you would find a description of all of the plans that are in place, the road network that would be used. It would describe things as for example for schools or vulnerable communities. And so if one wanted to have a look more specifically at what these plans are probably in a little bit more lay language than you would find in the Provincial Nuclear Emergency Response Plan. This would be a good document for people to go to, to look.

That is still on our website. So it's

still available publicly for anyone who would like to access it. And I think it describes what you were looking for, Dr. Binder, in terms of an emergency plan.

The other aspect that I would just reiterate is that during the assessment, we did do an evacuation time estimate study and as I mentioned earlier, that covers the 10-kilometre zone. It also looked at a shadow evacuation or those that would voluntarily evacuate beyond that zone and what the impact would be. And the results of that are described in the Environmental Assessment for Refurbishment as well.

So we have considered that there is an emergency plan. We describe it very thoroughly in this document, and we also describe the ability to evacuate the area.

THE CHAIRMAN: That will be useful and presumably you have the reference to those documents. Thank you.

Ms. Velshi, you want to follow up on what Dr. Thompson is suggesting here?

MEMBER VELSHI: I think that would be very helpful. And I think some of it is just timing of how these different pieces would fit together.

So if the EA were to be approved and then we'd fast forward to the licensing process and, as I asked

earlier, how these different pieces would come together, do you see that particular piece being done prior to that as well, so it's not just the Fukushima Task Force Action Plan but this additional activity with that?

DR. THOMPSON: Patsy Thompson for the record. Yes, it could be done and I think the timing would actually work. One of the very valuable information that we will be able to use is all the work that's being done on the health effects of the Fukushima accident.

There's a World Health Organization report that was published in 2012 and the United Nations Scientific Committee on the Effects of Atomic Radiation was tasked by the Japanese Government to do an independent assessment of the health effects of the accident. And that report is due to be submitted to the General Assembly in April.

And so we will have a lot of data information that we can build our assessment on.

THE CHAIRMAN: Again, I'm trying to get the timing; like how fast can you do this? That's number one. And number two, will this -- they're not listening to me.

DR. THOMPSON: Okay. So given the ---

THE CHAIRMAN: I'm not finished -- looked preoccupied.

DR. THOMPSON: Excuse me.

THE CHAIRMAN: Don't interrupt when I talk to her please.

What I wanted to know is the timing and I would also like to know whether it would cover what Greenpeace suggested the OPG to accident; would it cover that scenario too?

DR. THOMPSON: Patsy Thompson for the record.

It would. If you recall in the Greenpeace presentation, there was a table with three columns, and so we would look at the column with the safety improvements in place and do those categories.

And in terms of timing, I think September 2013 would be doable.

THE CHAIRMAN: And would you find some way, please, to be able to explain this in layman language?

DR. THOMPSON: Patsy Thompson, for the record. We will do our best, sir.

THE CHAIRMAN: We may all need some help in this because I'm not sure, listening to the four days here, that we find a way of explaining what ten to the minus 6 -- actually means.

DR. THOMPSON: Patsy Thompson, for the record. I think we'll need to avoid that kind of numbers.

THE CHAIRMAN: And one last thing I have to

ask you to also cover multiple units?

DR. THOMPSON: Patsy Thompson, for the record. It is part of the Fukushima Action Plan.

THE CHAIRMAN: And I've just been reminded a malevolent situation.

MR. JAMMAL: Ramzi Jammal for the record. The answer is yes, the document RC-1 will take into consideration that we are going to apply International Safety Standards from the EIA with respect to the multi-units -- cycled multi-units on site to include external and malevolent events.

THE CHAIRMAN: Okay, so again, I was -- and I don't want to put on the spot, this cannot be done before 2015?

DR. THOMPSON: Patsy Thompson for the record.

By targeting September 2013, it gives us time to not just do the calculations and the dispersion modeling but it also gives us time to take the data and turn it into a more layman type of document. And I think that's a fairly significant undertaking. So we would need to take the time to have it reviewed by people whose communication is maybe their day job rather than ours.

THE CHAIRMAN: Okay.

MR. JAMMAL: It's Ramzi Jammal for the

record.

Okay, we will start -- we will update you how much we can accomplish by September 2013 because we're not going to let this one go definitely. It's going to be part of the licence, but before the re-licensing, we will be providing this information and we'll provide you with a progress update on this.

THE CHAIRMAN: Okay. So who is ready to go for the next -- sorry? OPG.

MR. ELLIOTT: Mark Elliott, Chief Engineer.

I just want to make one clarification to an answer earlier to Mr. Harvey.

You mentioned was there a connection between concrete and robustness? There is a connection, the plane crash event with the health of the concrete.

So there is that connection but, as I said, the concrete is in good shape.

MR. TREMBLAY: Pierre Tremblay for the record.

Just the question was asked around our work with the CNSC. I mean we concur with what's being proposed here and we'll work through the Fukushima improvements as well as clear the licensing for the plant, which will come up in 2014.

THE CHAIRMAN: Okay. Thank you. Dr.

Barriault.

MEMBER BARRIAULT: Just a brief question with a long answer later on. I'm looking for information on closed circuit cooling systems, and I know that some studies were done in view of the new bill.

Can we have just a quick document really as to the advantage, disadvantage of closed circuits versus open circuits cooling systems and also the inherent dangers of a closed circuit system, if you do have a list of those.

Is that possible at all? I'd like to start off with OPG.

MR. TREMBLAY: Pierre Tremblay for the record.

We certainly looked at them and I think they were described by CNSC staff as "not a panacea". There's a number of issues and concerns around them certainly in terms of converting an open system to a closed system. It's a significant extensive piece of work that needs to be done.

Perhaps if there's someone who's better -- John Peters can speak a little bit to this issue.

MEMBER BARRIAULT: No. I don't have to have the answer now. You know, just if you could write it down, put it on paper when you have time to think about it

but go ahead, I don't want to interrupt you.

THE CHAIRMAN: Well, there's two things. First of all, if memory serves, the JRP asked you to produce a report on cooling tower and I think we've discussed this. Was this report done?

MS. SWAMI: Laurie Swami, for the record.

As I mentioned earlier, we have submitted that report to the CNSC staff and that's currently under review, and that included a consultation program with stakeholders to ensure that that was captured in the process.

THE CHAIRMAN: When will that review be done and the material posted? And was it independently done -- I thought it was done with some American experts, et cetera, et cetera.

MS. SWAMI: Laurie Swami.

Could I just clarify one thing? Our report is available on our website. So although we've submitted it to the CNSC and it's still under review, it is available publicly today.

MEMBER BARRIAULT: Thank you.

THE CHAIRMAN: Okay, that's good. I didn't realize that, but that was for the new bill, right?

MS. SWAMI: That's correct.

THE CHAIRMAN: Right. So now the question

is and I think what Dr. Barriault was trying -- so now you've got this -- and I assume this report will do some analysis of cooling towers versus the other systems.

So the next question is, what's a pro and con about applying it in a refurbishment scenario? And we had some about the redesign issues. Some intervenors said it will impact on the visual impact.

What else -- and you know, we've been asked for us to see a pro and con in all of this.

MS. SWAMI: Laurie Swami, for the record.

So the report that we filed, and we filed several reports on cooling towers, not just the latest one that was requested by the Joint Review Panel. We submitted a significant amount of technical information on cooling towers, different types of cooling towers, different types of impacts.

And when you look at that, while there may be benefits from a fish loss perspective in certain circumstances, it really doesn't apply to the Darlington design and because of the low impingement and entrainment results that we see for that design.

So then when you counter it looking at what are some of the impacts from that -- so in order to have cooling towers, you have to have a chemical system to manage the water chemistry of that cooling tower.

MEMBER BARRIAULT: The water. That's correct.

MS. SWAMI: So that adds to emissions, it adds to various other aspects in terms of handling the chemicals. So that's one aspect.

There's a noise impact from cooling towers. As Mr. Wismer mentioned earlier today, there's also -- because there's water withdrawal, there's a steam release, if you will, on an ongoing basis, depending on the type, and as a result of that, you can have fogging and icing on our facility.

So that would have an impact on our existing equipment, which could cause problems whether from a safety perspective for our staff or an equipment issue on the operation of our facility.

So those are some of the impacts, and that's ---

MEMBER BARRIAULT: And that's what I was looking for, the inherent dangers of these things.

MS. SWAMI: There are many other aspects that you have to take into consideration. It's not a simple this solution is the only thing that you have to consider.

So when you look overall -- and that's what this study that we've done for new nuclear most recently

did, was looking at the overall impact and taking into consideration all of those factors, you come up with a result that OPG believes that there's still not a good solution for the Darlington site.

THE CHAIRMAN: But that's the first time we heard some of the con. It wasn't discussed here in those four days. All we heard about is stop killing fish. We didn't hear some of the other side, and that's what we're trying to find out.

MS. SWAMI: Laurie Swami, for the record.

I appreciate that, and I also appreciate the opportunity to have that discussion now.

MEMBER BARRIAULT: Thank you.

CNSC, any comments?

MR. McALLISTER: Andrew McAllister, for the record.

I'll just reiterate a few key points.

The Lake Ontario Waterkeeper and other intervenors have honed in right away on cooling towers, which is a potential mitigation option.

When you're doing your environmental assessment, you know, you establish what your project is, you look at what your environment and look at the effects. In this case, as we've -- it's been laid out a lot, the effects were low. The impingement is low. The

entrainment is low.

We looked at the thermal effects during one of the warmest winters on record, and it was very low.

And are we able -- is it an adverse effect? Yes, we said it was an adverse effect. Are we able to mitigate it? Yes, we are able to mitigate it. And DFO, under its regulatory statutes under the *Fisheries Act*, were able to do that through habitat offsets.

It's not that we were dismissive of towers. We were just looking at the magnitude of the impact and looking at the mitigation measures that could deal with that magnitude of the impact, and the habitat offsets was the approach that made sense and that led to the ultimate conclusion of it not being significant.

MEMBER BARRIAULT: So ---

MR. McALLISTER: However -- sorry.

MEMBER BARRIAULT: Yeah. Was that the review of what OPG sent out to you folks that you're giving me? Is that written, that review?

MR. McALLISTER: That's summarized in our environmental screening report, but I've just sort of laid out those key points.

In other words, we talked about impingement, Round Goby, alewife, common invasive species and as well as the entrainment in thermal ---

THE CHAIRMAN: We're not questioning you on DFO conclusion on the side of going with what's through here. What we don't know within here is what are the -- some of the downside on cooling towers. That's the other side of the equation that was not discussed here.

MR. McALLISTER: To -- I guess to complement Ms. Swami's response to that, I'll ask Don Wismer to add any further details.

MR. WISMER: Don Wismer.

I commented earlier today on the last page of the New York State policy on intake fish protection where they listed some of the downsides of towers. And they require their facilities to go through an assessment of those factors.

And the things like damage to terrestrial habitat, there could be human health effects, visual effects, noise, water air emissions, water use.

Towers have a -- evaporative loss. So you lose water. Once through, the water goes through the plant, but it gets returned. So you don't get the consumption of water that you do with towers.

And in the U.S., especially further south, water shortages are becoming a big issue, so they're starting to take a second look at going totally into towers because they've got water consumption problems.

And then there's -- there can be host community perspectives like the visual effect issues.

But as we heard from OPG, on their website they have the technical report that has these comparisons and also the public stakeholder report that they went through for the new build, so ---

THE CHAIRMAN: Is the New York analysis available?

MR. WISMER: Yeah, it's on the web. I can give you the reference. Not right now.

THE CHAIRMAN: Yeah, I think it will be useful for us because a lot of what we heard from a lot of intervenors was that cooling now is becoming the law of the land in the U.S. And in fact, we were told that EPA is about to come up with their own policy about -- if I thought what is being suggested will become mandatory.

MR. WISMER: Well, the -- Don Wismer.

There is one rule right now for new plants, and that's -- it doesn't require towers. It says performance equivalent.

So what does that mean? That means you have to reduce impingement and entrainment both by 90 percent.

For an existing plant, which I think is where the refurb would come in, the rule has not been

finalized. It won't be until next summer. And it doesn't require towers. It requires reducing impingement 88 percent, which Darlington does.

And then entrainment, there's no technology for that that can be standard across the nation in the U.S., so they leave it up to the local permitting agency to sort it out.

THE CHAIRMAN: Okay, thank you.

MR. WISMER: Just one last thing. There was a third party involved, Pacific Northwest Labs, that is a common consultant to the U.S. NRC on these issues, and they helped us in our review of OPG's tower report. So we got two reports from them.

THE CHAIRMAN: So when is the CNSC review be complete?

MR. WISMER: Well, Dave Newland was here -- Don Wismer again -- and I believe I heard him say in this hearing February 2013. I think that was the date I heard.

THE CHAIRMAN: Okay, thank you.

Ms. Velshi?

MEMBER VELSHI: I had a question around the requests we were continuing to get around bumping this up to a JRP. And we did ask the question to staff and got a response. I'm going to try to redirect what I think I heard.

But even after the question had been answered, we still kept on getting that recommendation. So whether that was just because people had come with a prepared -- pre-prepared stuff or whether they still felt that it needed to be done.

So what I heard you say, the difference between the screening level, the current one, which now, of course, the legislation has changed, and -- but the scope had been determined by the Commission.

The panel, if it were to go to a panel, it would still be the Commission and the level of assessment, the technical assessment done by OPG, done by staff was as though it was a panel, so really, that detail doesn't change. And so what exactly is it that the intervenors were hoping to get from a panel that they believed that the screening level assessment did not provide them?

DR. THOMPSON: Patsy Thompson, for the record.

My impression is that a lot of the intervenors were, I guess disappointed is probably the better term, and we heard it a lot at the New Build hearing as well, that my sense is that they feel that there is no forum to discuss policy issues related to energy production options and they see the need for alternatives as a way of being able to deal with those

issues.

When we did the need for alternatives and I'll let Andrew explain, Andrew McAllister explain what the CEAA legislation says, but when we look at alternatives, we have to look at it within, you know, the CNSC and the federal government responsibilities and it's not something that we can deal with. But I'll let Andrew explain what the requirements are in terms of alternatives to the project.

MR. McALLISTER: Andrew McAllister, environmental specialist for the record.

With respect to, and we're talking about the *Canadian Environmental Assessment Act*, that's been recently repealed because there is no mention of these two terms in the new *Canadian Environmental Assessment Act, 2012*.

In the need and alternatives to the Canadian Environmental Assessment Agency has an operational policy statement or it's either an operational policy statement or guidance document; it's one of the two, available on their website which outlines the guidance around the need and alternatives to.

When they talk about alternatives to, it's alternatives to that are within the control of the proponent and the proponent's need for the project. And

these two items were looked at in the Darlington New Build Joint Review Panel and that's typically the type of assessment that looks at those -- look at those factors were at the comprehensive study level or the review panel level in the old *Canadian Environmental Assessment Act*.

In the case of screening level environmental assessments, it's at the discretion, the responsible authorities, and in this case and consistent with past refurbishments and environmental assessments, it wasn't considered part of the scope of factors that was looked at.

So in other words, it's looked at in the old *Canadian Environmental Assessment Act* and it was certainly a topic that was debated quite a lot during the New Build hearings. Again, it transcended into provincial policy matters and certainly that panel brought the policy makers to the table to get more information on it, but at the end of the day the panel certainly summarized its views on that in the panel report.

And again, moving ahead to the new *Canadian Environmental Assessment Act*, and as Dr. Thompson mentioned yesterday, should you the Commission, refer it to a panel, it would come back to yourselves under CEAA 2012 and those two items are no longer in that legislation.

THE CHAIRMAN: Well, to be a little bit more fair to those intervenors, the Joint Review Panel is a little bit more political because first of all it will be two agencies, CEAA and CNSC, if it were to refer to a panel.

DR. THOMPSON: Patsy Thompson, for the record.

The CEAA 2012 makes the CNSC the sole responsible authority.

THE CHAIRMAN: I'm talking about right under the old one.

DR. THOMPSON: Under the old one ---

THE CHAIRMAN: We are still under the old one.

DR. THOMPSON: Not for this one. For this one the screening is under the old legislation.

THE CHAIRMAN: That's what I mean. But if we still continue to operate under the old one, if I understand correctly, I think for the completion of this we are still under the old one. Is -- we've got a lawyer here to tell us.

DR. THOMPSON: Patsy Thompson, for the record.

The Minister identified this EA to be continued under the existing legislation for this

screening, yes you're correct. But I think Mr. Saumure will be ---

THE CHAIRMAN: Am I right for a change?

MR. SAUMURE: Thank you. There's my opportunity before the end of the hearing.

Under the new CEAA 2012 there are transitional provisions under the section 124 that provides a screening that are ongoing, are continued under the old Act. But if for any reasons that screening needs to be bumped up to a panel, then you fall under the provisions of the new Act, which the new Act basically says, yes the Minister can refer to a review panel but under section 38, the Minister cannot refer to a review panel nuclear matters; it would be the CNSC.

THE CHAIRMAN: So even, just to put it to -
- so even if we wanted to refer it to a review panel, it'll be referring it back to us under the new Act.

DR. THOMPSON: Patsy Thompson, for the record.

That's my understanding.

THE CHAIRMAN: Right.

DR. THOMPSON: But also just to complete the information. The need in alternatives to the project were considered for the New Build, but in reality although people brought energy policies to the table and the panel

members invited representatives of the Ministry of Energy, the decisions and the recommendations were not based on that information.

THE CHAIRMAN: But again I think there's an enormous misunderstanding when those people are recommending to go to the review panel. I don't think understood, just the nuance that we just heard about it. Because under the old system, we go back on the old system, there were two agencies would be us and CEAA, then there will be some external panel appointed by the Minister of Environment and they will become commissioners and then a report is to be sent back to the government.

So it becomes a lot more political. None of this processes operate, even if we wanted to operate them now under this new legislation, we couldn't do it that way. Did I get this right?

Denis.

MR. SAUMURE: Denis Saumure, for the record.

Yes, you have it right. It would go back to the -- CNSC is the RA for all nuclear projects.

THE CHAIRMAN: Okay. So I think that in summary, there's not much to be gained by even talking about this as an upgrading -- so-called upgrading it. I don't agree with necessarily the term of the upgrade but

referring it to a review panel doesn't do anything new here.

DR. THOMPSON: That's correct and as we said, alternatives to and need for the project are no longer in the CEAA 2012 legislation.

THE CHAIRMAN: Okay, thank you. That's very useful.

Okay, Thank you. Dr. McDill.

MEMBER MCDILL: After that very high level thing, I have some kind of niggling issues, is that okay?

THE CHAIRMAN: Yes.

MEMBER MCDILL: Do you want me to lump them or go around the table one more time; three small things.

THE CHAIRMAN: Go ahead.

MEMBER MCDILL: So if I could ask a little bit about the heavy water storage building and the safety issues, at Lepreau they collected but didn't detritiate. You're going to collect and detritiate so that adds one step in the handling. Could you just discuss a little bit about the building, whether it's got double wall, containment leak protection, et cetera?

MR. REINER: Dietmar Reiner, for the record.

So the primary purpose of that building is to store the heavy water that will get removed during the

refurbishment. So it will -- the heavy water will be put into tanks. That building will have all of the appropriate monitoring and control systems implemented to ensure that ventilation systems, those sorts of things, protect from tritium releases.

The process itself, once the heavy water is in the storage tanks, those tanks are integrated with the tritium removal facility and then the tritium removal can take place separately over the course of time. There isn't sort of a -- necessarily a stepwise thing that gets in the way here, but that building will be constructed to all of the requirements to store the heavy water and ensure that any tritium releases are well within all of the limits that we have to operate under.

MEMBER McDILL: Thank you. Staff, was an additional heavy water storage building required at Bruce? Or did they have one from the old heavy water manufacturing facility?

MR. WEBSTER: It's Phil Webster, for the record. As it happened, I was the -- in the equivalent position for the Bruce at the time. And they were in the fortunate position of being able to store the heavy water from Bruce A at Bruce B.

MEMBER McDILL: So Darlington requires a new building, then?

MR. WEBSTER: That's correct.

MEMBER McDILL: And Lepreau didn't because it was a single unit?

MR. RZENTKOWSKI: That's correct. Point Lepreau used a resin tank to store the heavy water during the refurbishment activities.

MEMBER McDILL: My next smallish question is -- sorry -- oh, there it is. It's on page 35. Again, it's relatively minor in terms of overall -- it's very low level, I guess, or medium level.

In terms of temporal boundaries as units go on -- off grid and then eventually come back on grid through the refurbishment stage, will there be interaction with OPA and other suppliers, hydro electric, all the other units -- I mean, OPG's got a lot of -- a lot more than just nuclear -- so that, for example, if the manufacturing sector has a wonderful, marvellous surge that there is sufficient power available coordinated among all the suppliers?

MR. TREMBLAY: Pierre Tremblay, for the record. For some time now, OPG doesn't really have the obligation to serve and so that is really the responsibility of the independent operator and the OPA in terms of the long-term plan.

So clearly we communicate with those

organizations to let them know what our plans are and schedules and so on, but that is not an obligation of the company.

MEMBER McDILL: Thank you. And my third small question relates to page 73. And I -- perhaps I'm misreading the table 4.12.1. Was strontium found in two small watercourses in the southwest corner of the Darlington Nuclear site?

MR. TREMBLAY: Pierre Tremblay, for the record. I'm not sure we've got the reference here. Is it the Darlington refurbishment or is this the operating licence?

MEMBER McDILL: Yeah, page 1373, the very bottom in "Amphibians and Reptiles".

MEMBER HARVEY: It's a small table at the bottom.

MEMBER McDILL: Very -- small table, small animal, small element.

MR. TREMBLAY: So, yeah, John Peters please.

MR. PETERS: Yes, John Peters, for the record. Yes, we did do actual sampling of these watercourses, and yes those samples did show small exceedences of chromium and strontium. This was not different than what we had expected. We saw similar small

exceedences in the new nuclear sampling we'd also done.

MEMBER McDILL: I understand that from the second page of that table, but you don't know where they're coming from? Or if they're not coming from Darlington, maybe you can ---

MR. PETERS: Yes, I can clarify that we know that they're not coming from Darlington. They're presumably part of an historic emission followed of some kind.

MEMBER McDILL: Is this something that, again, we're talking about frogs and -- but is this something that staff is concerned about?

MR. McALLISTER: Andrew McAllister, for the record. No we're not. We were satisfied with the information that OPG provided in the explanation for the observed increase.

MR. PETERS: If I can just add a small comment. There is an ecological risk assessment done for all of the pathway analysis that was necessary here. And we did not see these particular exceedences being a concern at all from a biological health perspective.

MEMBER McDILL: There is a rather large decrease in amphibian population in Ontario and I -- it's one of those things one should be concerned about.

MR. PETERS: Fair enough. The opposite is

true at Darlington. We are having a tremendous increase in our amphibian population as, again, part of our biodiversity program is being very successful.

MEMBER McDILL: Thank you for that.

THE CHAIRMAN: Thank you. Anybody has any remaining questions? Go, please.

MEMBER VELSHI: One of the issues that came up, particularly it was the latter part of the hearing, was around a population around nuclear power plants and, you know, some indication that New York having certain plants and shutting down the nuclear plant close to New York City.

And in the CMD on H13.1, page 11, on land use, mentions, you know, future population growth and so on has been reviewed and it's comparable with continued operation plans. I'll ask OPG first and then to staff.

Is this a risk area that if the population continues to grow as it has -- and I think it's doubled every, I don't know, 15 years, if I recall the chart that we had seen -- and given some of the emerging trends in this area, is there something more formal needed here?

We did ask the question of Durham Region and they said, "Well, it's a province -- provincial jurisdiction, so really outside our mandate." But is this a cause for concern, from your perspective?

MR. TREMBLAY: Pierre Tremblay, for the record. Are -- you're referring to the emergency response aspect of this or what precisely?

MEMBER VELSHI: Both -- both -- both emergency response as well as health impact. So, you know, should there be more controls around land use?

MR. TREMBLAY: John Peters will deal with one of those aspects.

MR. PETERS: I want to talk about the population growth generally and in relation to land use. I won't reiterate all of the -- what the municipality said, but clearly they have recognized this issue. They have an official plan that has a good managed process in the vicinity of Darlington that will not lead to increase in population locally in the three kilometre and closer zone.

I want to emphasize that, because those areas are all now turning into light industrial commercial uses and -- or they're going to remain in green space, based on the plan out to -- almost to the end of life of this facility, according to the planning that's in place today.

The other point that's really important is that the evacuation time estimate studies that we did point out that there is ample evacuation routes out of

Darlington now.

And the actual evacuation time estimate study showed that those times will go down in the future even with population growth because the 407 and the other expansions of the 401 to wider lanes and the GO train availability and a wide range of things will actually increase the capacity to evacuate in the future, not decrease it. So you're not in a situation that it has an impending problem in the near term.

Having said that, I think yes, we are communicating with the province through the provincial planning policy statements and we are seeking to get a certainty through all the planning processes. That's a normal part of what our real estate services people do and we continue to emphasize that in all of the opportunities that we get.

So from a land use point of view, we are vigilant. And the other interest parties are vigilant. The evacuation issues are not a problem for this population growth that we've modelled.

From a human health perspective, again the population in the area is getting extremely small doses today. And there's no reason, given the nature of the growth we're talking about, to see that change over the life of the facility, from a strictly radiological

perspective. There doesn't appear to be any reason for someone to be concerned. Laurie?

MEMBER VELSHI: Staff want to add anything to that?

MS. THOMPSON: I'll -- Patsy Thompson, for the record. I'll say a few words in terms of the EA and perhaps Andrew McAllister can -- will add something, if needed.

The EA took into consideration the assumptions that OPG had described. And we -- also one of the recommendations of the Joint Review Panel was for discussions and ongoing discussions with -- between OPG and the municipality and the province in terms of making sure that there is adequate communication and controls in terms of land use.

In doing the assessments, we looked at population growth and population density, as was explained, in terms for accidents and malfunctions and evacuation plans. And moving forward there's a requirement under the EA for a follow-up monitoring program, and so there's a requirement to update and maintain that information to make sure that the assumptions in the EA remain valid.

So I stand corrected; it's not an element in the follow-up program, but it's being handled through

the discussions.

MR. PETERS: Yeah, I think that -- John Peters, for the record. OPG has in both new nuclear and in the refurb indicated we intend to continue to track this as essentially a verification process for ourselves that we're not trending in the wrong direction, from a population point of view.

THE CHAIRMAN: Do you have any rights in terms of land use development near the site? Do you have any -- did they consult with you regularly or is it totally up to the local counsel to decide?

MR. PETERS: John Peters, for the record. Yes, from a provincial policy planning process point of view, OPG is listed as a to be notified party for all of the development applications that take place within the Durham region. So we are aware of and offer the opportunity to comment. We are formally notified of all of the applications that go forward.

THE CHAIRMAN: At one time there was a lot of push about putting a regulatory exclusion zone. I don't know if you remember that. It tried to define not only the site but some beyond. Is that something that is being thought of, or is required, or not?

MR. PETERS: As I said, OPG reviews each application on its own merits and looks to see if we wish

to make a comment to the planning authorities according to our interests. There is no requirement for that to be done at this time.

THE CHAIRMAN: Thank you.

MS. SWAMI: Laurie Swami, for the record.

I would just add that the Darlington site is well buffered. There's industrial lands around our facilities. There is a lot of agricultural lands to the north of the facility. And we don't anticipate there's going to be a significant population growth within the general and close proximity to our facility, which will allow us to ensure that the evacuation plans continue and that public dose, as John has described, will remain in the low levels that we see today.

THE CHAIRMAN: Okay. Anybody else, any remaining questions?

I just have one. In both documents there's an extensive follow-up commitment. I just want to look at you and say you'll deliver all of those by 2014. I'm reading, for example, there's a whole chapter on follow-up. But on -- there's a long list here about things to do, follow-up program, you know, surface water continued operation.

And the one area where I don't know if it's feasible, maybe a different -- or even further improvement

on tritium in a refurbished facility. Will there be an improvement in tritium emission control management?

MR. TREMBLAY: Pierre Tremblay, for the record.

We have -- so two things I think that I hear. The first is with regards to specific commitments that are in various documents, either consistent with the licensing regime, or the ISR, and so on, and those are documented, those are commitments by us and we will meet those.

The second question is around tritium management and reduction of our footprint. That's our philosophy of operation, which is continuous improvement. And so if you look at the releases from the sites over the last numbers of years you'll see a trend and that trend is in the improved direction, and that's because we work very hard at reducing the amount of our effluents. And so tritium is no different.

So absolutely we will endeavour to continue as part of our operations, let alone as part of the refurbishment.

THE CHAIRMAN: But I think, given the concern about tritium, it would be nice if there was some -- this is an opportunity, you know, for refurbishing. Any improvement in the on-going should be highlighted and

implemented.

MR. TREMBLAY: Pierre Tremblay, for the record.

That's well taken. And there are some things, for example, that will lead to reduced leakage, for example, from the reactor phase during outages, closure plugs and so on, that we intend to -- you know, to basically reduce releases and so on. So certainly we could highlight those.

THE CHAIRMAN: Taking a reference particularly to the one incident in 2009 that we heard a lot about. Hopefully you'll find a way of making sure it doesn't happen again.

MR. TREMBLAY: Pierre Tremblay, for the record.

That certainly was a significant event for the site and a lot of learning. So absolutely a number of corrective actions there and procedural changes.

THE CHAIRMAN: Okay, the time has come. I think you have the last word.

MR. TREMBLAY: My, my.

(LAUGHTER/RIRES)

MR. TREMBLAY: Pierre Tremblay, for the record.

Chairman Binder and Members of the

Commission, OPG thanks you for the fair and open way in which you've conducted these hearings.

I'd also like to thank Louise Levert for her work organizing these proceedings, and to the Municipality of Clarington, and Hope Fellowship Church for being good hosts. We certainly have been in the facility a lot in the last few days.

Nuclear power in Canada is a highly regulated industry with many levels of oversight. The CNSC, being our primary regulator, holds nuclear utilities accountable to high safety standards and compliance with stringent regulatory requirements, though the Ontario Power Authority, the Province of Ontario is responsible for deciding the generation supply mix needed to meet Ontario's energy needs. We've discussed that several times this week.

Nuclear power is currently set at 50 percent of this mixture. The Darlington station plays an important role by providing approximately 20 percent of the provincial energy needs safely, virtually emission free and at a low cost.

OPG remains confident that the cost of the Darlington refurbishment project -- and we saw lots of numbers floating around -- is between \$6 billion and \$10 billion based on 2009 dollars.

With refurbishment OPG plans to make a significant investment in the Darlington station to ensure another 30 years of safe reliable operation.

For the environmental assessment, OPG has provided an extensive and robust environmental impact statement which details the areas of environmental effects and describes the appropriate mitigations. The results in these proceedings have confirmed that the refurbishment and continued operation of Darlington will not result in significant adverse environmental effects given plan mitigations.

As I've already stated, OPG has listened carefully through these proceedings to the participants and heard the many concerns regarding openness and transparency associated with emergency planning and, you know, are taking some action.

I would like to add, however, a personal note. For the 7,000 skilled and dedicated OPG employees who are part of nuclear operations and support departments, OPG employees not only live and work in this community but many of us have raised our families here as well. Our employees volunteer their time and they care about our community and would do nothing to jeopardize the health and safety of our families, our friends and our neighbours. We consider it a privilege, not a right, to

operate our nuclear facilities in this community.

To highlight some of the discussions -- the key discussions that have occurred during these hearings, OPG offers the following very brief comments.

Some intervenors have stated that we did not evaluate a range of accidents that address the requirements of the CEAA. We would like to remind the Commission that there are two separate overlapping processes involved with the issue. We've completed the PRA for the Darlington station in accordance with the CNSC regulatory requirements at the same time as we carry out the environmental impact statement work. The PRA identified areas where safety could be further enhanced that addressed large releases -- large release events. This resulted in the safety improvement opportunities that we are implementing, as discussed by mark Elliot.

The evaluation of accidents in the EA was based on post-refurbishment conditions, which included implementation of the safety improvements.

We would like to make it clear that our environmental impact statement and the CNSC's proposed screening report fully address the requirements of section 16 of the CEAA to assess accidents that may occur.

OPG will continue to learn from the events of Fukushima Daiichi plant. We now have in place

procedures, emergency mitigating equipment that will further enhance the safety of our plants by ensuring that we can provide continuous fuel cooling in the extremely unlikely event of a sustained loss of all onsite and offsite power. This was well illustrated in the CNSC's video.

The environmental assessment results show public dose is not predicted to exceed the lower provincial action limits required for evacuation. This is a testament to the robustness and safety features of the Darlington station.

In addition, you have heard that OPG has enhanced its emergency preparedness plan, notwithstanding the discussion we've had and the good actions taken, to incorporate beyond design basis accidents and severe accidents.

Furthermore, our community partners have confirmed that they have emergency plans in place to deal with severe events and for evacuation.

We respect the relationship we have with our station host communities. We recognize that public confidence is something that has to be earned and nurtured, or it can be taken away.

While we are here today with applications for our regulatory operating licences, it's the community

that grants us our social operating licence. So we must endeavour to earn the trust each and every day of our operation.

In summary, Darlington nuclear generating station and the Darlington waste management facility have excellent safety performance records that have been recognized by the CNSC and by external industry peers. We have followed the requirements of the environmental assessment process, which has shown that refurbishment and continued operation will not have adverse impact on the environment.

We respectfully request the Commission to approve renewal of the Darlington station and waste management facility operating licences in approval of the Darlington refurbishment environmental assessment.

The Darlington station is a significant public asset and OPG is committed to continue the operation of this facility as a top-performing plant over the next 30 years.

Thank you very much.

THE CHAIRMAN: Thank you.

This completes the public hearing. I would just like to thank CNSC for being patient and very, very professional with us.

And I think the Commission now will retire

to its deliberations.

Thank you.

--- Upon adjourning at 6:37 p.m./

L'audience est ajournée à 18h37