

DARLINGTON NEW NUCLEAR POWER PLANT PROJECT

JOINT REVIEW PANEL

PROJET DE NOUVELLE CENTRALE NUCLÉAIRE DE DARLINGTON

LA COMMISSION D'EXAMEN CONJOINT

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JOINT REVIEW PANEL

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(ii)

TABLE OF CONTENTS / TABLE DES MATIÈRES

	PAGE
Opening remarks	1
Undertaking status	3
Presentation by Dr. Edwards	9
Questions by the panel	22
Presentation by Mr. York	27
Questions by the panel	47
Questions by the public	64
Presentation by Ms. Jacklin	67
Questions by the panel	79
Presentation by Mr. Wilson	93
Questions by the panel	115
Questions by the public	122
Presentation by Ms. Cockburn	125
Questions by the panel	131
Questions by the public	146
Presentation by Dr. Carter	148
Questions by the panel	160
Questions by the public	169
Presentation by Ms. Hawkins	171
Questions by the panel	180
Questions by the public	191
Presentation by Mr. Chopik	199
Questions by the panel	208
Presentation by Ms. Carpenter	219

(iii)

TABLE OF CONTENTS / TABLE DES MATIÈRES

	PAGE
Questions by the panel	233
Written submissions and comments by the panel	251

1 Courtice, Ontario

2

3 ---Upon commencing at 9:00 a.m. /

4 L'audience débute à 9h00

5 --- OPENING REMARKS:

6 MS. MYLES: Good morning,
7 everyone.

8 My name is Debra Myles. I'm the
9 panel co-manager. Welcome to today's session of
10 the Darlington New Nuclear Power Plant Project
11 Joint Review Panel.

12 Secretariat staff are available at
13 the back of the room. Please speak to Julie
14 Bouchard if you are scheduled to present today, if
15 you'd like permission to put a question to the
16 panel chair for a presenter, or if you have not
17 previously registered to make a presentation and
18 would now like to do so.

19 The opportunity for questions to
20 presenters and to make an oral statement if you
21 haven't previously registered are subject to the
22 availability of time.

23 We have simultaneous translation
24 at all the sessions. Headsets are available just
25 at the back of the room in the middle. English is

1 on channel 1 and French is channel 2.

2 Written transcripts of these
3 proceedings will reflect the language of the
4 speaker and will be available on the Canadian
5 Environmental Assessment Registry internet site for
6 the project.

7 Please identify yourself each time
8 you speak for the purpose of identification on the
9 transcripts.

10 As well, the session is being
11 webcast live and audio files and the webcast will
12 be archived on the Canadian Nuclear Safety
13 Commission website.

14 As a courtesy to others in the
15 room, please silence your cell phones and
16 electronic devices.

17 Mr. Chair.

18 CHAIRPERSON GRAHAM: Thank you
19 very much, Debra, and good morning everyone again,
20 and welcome to the hearings here today. I want to
21 welcome everyone who's here in person, those on
22 live link and also those that are on the -- joining
23 us on the internet.

24 My name is Alan Graham and I am
25 the Chair of the Joint Review Panel. The other

1 panel members with me today are Madam Jocelyne
2 Beaudet, to my right, and Mr. Ken Pereira, to my
3 left.

4 This is the second Saturday that
5 we've had hearings. In addition to that, we've had
6 two evening hearings and scheduled two other
7 evening hearings for next week to accommodate those
8 that can't necessarily come during the workweek and
9 we do want to accommodate everyone possible that
10 does want to appear, either as observers or as
11 intervenors or as just interested in this panel's
12 review of this project.

13 --- UNDERTAKING STATUS:

14 CHAIRPERSON GRAHAM: With that, I
15 will start this morning's session with a review of
16 undertakings.

17 We do undertakings every day and
18 Mr. Pierre-Daniel Bourgeau will give us an update.
19 Our legal counsel will give us an update on the
20 undertakings that are outstanding or due today.

21 MR. BOURGEOU: Good morning. I
22 would like to remind you that the undertakings list
23 is updated daily on the CEAA registry.

24 In the panel hearing undertakings
25 that are due today, I will turn my attention to

1 CNSC in regards to Undertaking number 37, to
2 describe information that CNSC has drawn from
3 containment methods used by other industries. This
4 undertaking has been answered and the panel will
5 post the document on the CEAA registry.

6 In the matter of Undertaking 40 to
7 the CNSC for dose rates for low and intermediate-
8 waste transport packaging. Are you prepared to
9 address this undertaking?

10 MR. HOWDEN: Barclay Howden
11 speaking.

12 Yes, I am.

13 CHAIRPERSON GRAHAM: Go ahead, Mr.
14 Howden.

15 MR. HOWDEN: Okay. The electronic
16 version of the document will be submitted to the
17 Secretariat today, but I'd like to just summarize
18 the information in it.

19 This speaks to the packaging and
20 transport of nuclear substance regulations. Two of
21 the questions were what are the regulatory limits
22 and what are the average actual dose rates.

23 So the regulatory limits on low-
24 level waste and intermediate-level waste, or
25 uranium hexafluoride because that was also

1 discussed, packages are 2 millisieverts per hour on
2 contact and .1 millisieverts per hour at one metre.

3 Just to give you some context,
4 last year OPG shipped 248 shipments of low-level
5 waste with an average dose rate of .09
6 millisieverts per hour on contact and .02
7 millisieverts per hour at one metre.

8 Last year, OPG shipped 46
9 shipments of intermediate-level waste in 2010. The
10 average dose rates were .006 millisieverts per hour
11 on contact and .002 millisieverts per hour at one
12 metre.

13 You will note that the dose rates
14 on the intermediate-level waste are lower than the
15 low-level waste and that's due to the fact that the
16 intermediate-level waste are shipped in shielded
17 Type B containers.

18 For the uranium hexafluoride, the
19 average measurements for those containers are .04
20 millisieverts per hour on contact and .004
21 millisieverts per hour at one metre. And those
22 dose rates include neutron radiation.

23 And separately in 2005, the CNSC
24 did separate measurements of groupings of uranium
25 hexafluoride; uranium hexafluoride cylinders in the

1 Cameco yard to try to measure neutron radiation by
2 itself and the dose rates that they received for
3 those measurements were .001 to .003 millisieverts
4 per hour at one metre.

5 The rest of the information will
6 be submitted this afternoon, Mr. Chair.

7 CHAIRPERSON GRAHAM: Thank you
8 very much.

9 Mr. Bourgeau?

10 MR. BOURGEAU: In regards to
11 Undertaking 42 to the CNSC for dose limits for U.S.
12 and international nuclear workers, this undertaking
13 has been answered and the panel will post the
14 document on the CEAA registry.

15 In regards to Undertaking 17 to
16 the Ontario Ministry of the Environment for status
17 of updated storm water management document, this
18 undertaking has been answered and the panel will
19 post the document on the CEAA registry.

20 In the matter of Undertaking
21 number 39 for Green Peace to provide a copy of the
22 report on Green Energy Coalition's submission to
23 the Ontario Energy Board, this document is
24 outstanding and we will get back to you on it at
25 our next meeting on Monday.

1 In regards to Undertaking 47 to
2 Ontario Clean Air Alliance to provide information
3 on Ontario's Clean Alliance participation in the
4 public consultation phase of the development of
5 Ontario's long-term energy plan, this document has
6 been received and we posted it on the CEAA
7 registry.

8 In the transcript of the Joint
9 Review Panel hearings Thursday, March 31st, in
10 Volume 10 of the transcripts between pages 173 and
11 175, in regards to the written submission from St-
12 Mary's Cement, the panel stated that they would
13 deliberate if they would ask for clarification to
14 that written statement.

15 The panel has decided to do so and
16 will be making this Undertaking 60 to St-Mary's
17 Cement to clarify the comment saying that nuclear
18 power is sustainable and green.

19 This is the end of the
20 undertakings.

21 CHAIRPERSON GRAHAM: Thank you
22 very much, Mr. Bourgeau.

23 Now, just one other procedural
24 matter on undertakings and I'm going to refer to --
25 I think it's Undertaking 15, which -- Undertaking

1 15 which was to OPG to provide visual impact
2 assessment of hybrid or mechanical draft cooling
3 towers with plume abatement.

4 I understand that you would have a
5 short presentation and we're going to schedule that
6 for Monday, if you can be prepared to have that
7 short presentation.

8 April 6th, okay, Monday or Tuesday.
9 I'm not sure of dates then. But it will be
10 scheduled for early next week, and just
11 -- we understand you have about a 10-minute
12 presentation on that.

13 So we'll just give you a little
14 forewarning that we'll have it on the agenda and
15 the panel Secretariat will inform you of that.

16 MR. SWEETNAM: Sorry, Albert
17 Sweetnam, for the record.

18 Our understanding was that it
19 would be on the 6th.

20 CHAIRPERSON GRAHAM: The 6th, all
21 right. I'm not sure of the dates, what day the 6th
22 is, so ---

23 MR. SWEETNAM: Okay.

24 CHAIRPERSON GRAHAM: --- I said
25 Monday, the 6th.

1 MR. SWEETNAM: It's Wednesday.

2 CHAIRPERSON GRAHAM: Next
3 Wednesday.

4 MR. SWEETNAM: Okay.

5 CHAIRPERSON GRAHAM: Very good,
6 then; that's when it'll be scheduled for.

7 So with that next on the agenda
8 this morning is oral statements. And we have one
9 oral statement that has been requested by the
10 Canadian Coalition for Nuclear Responsibility to be
11 presented by Dr. Edwards. And oral statements are
12 limited to 10 minutes, and following oral
13 statements only panel members may ask questions.

14 Dr. Edwards, welcome this morning
15 again, and the floor is yours, sir.

16 --- PRESENTATION BY DR. EDWARDS:

17 DR. EDWARDS: Thank you very much,
18 Mr. Chairman.

19 Since I only have 10 minutes, I
20 have to speak fairly bluntly, but it's not meant to
21 offend any individual. It's -- I think it's an
22 important -- some very important issues here, and
23 very seldom does -- do members of the public have a
24 chance to raise these issues in any significant
25 forum that has any legitimacy.

1 I do feel that the panel -- two
2 members of the panel are not in a good position to
3 really judge the adequacy of the regulation of this
4 industry due to a conflict of interest, which is
5 not of their choice, perhaps, but that's the
6 situation.

7 My own feeling is that they should
8 be recusing themselves from judgment since the
9 environmental assessment really depends not only
10 upon the proponent, but also the regulatory
11 apparatus that's going to be looking after that
12 proponent.

13 The CCNR, Canadian Coalition for
14 Nuclear Responsibility, is of the opinion for many,
15 many years, over 30 years, that Canada does not
16 have sufficient public accountability or
17 responsibility in the nuclear field, that, in fact,
18 the nuclear industry and the regulatory agency have
19 acted together almost as a state within a state,
20 that is almost invisible to the ordinary citizen or
21 to the politicians, our elected representatives.

22 We've seen in Japan the sad
23 spectacle of a government which is struggling to
24 cope with a situation which they are really unable
25 to cope with because they have depended so much on

1 the industry and on the regulatory agency to look
2 after things.

3 And now, all of a sudden, they
4 have to look after it and they don't know how to do
5 it. But at least in Japan they have a sense of
6 consequences.

7 In 2002, three senior executives
8 of the TEPCO, the Tokyo Electric Power Corporation,
9 were forced to resign, and two other advisers were
10 also forced to resign because of falsifying
11 information regarding safety.

12 Here in Canada it doesn't seem
13 there are any repercussions. It seems that the
14 CNSC and previously the Atomic Energy Control Board
15 are more like a coach than a referee.

16 Nobody ever goes to the penalty
17 box, nobody ever gets suspended, they just get a
18 scolding and sent to the showers and they're ready
19 to play the game the next day.

20 We've had situations where, for
21 example, with regard to the NRU reactor at Chalk
22 River, we've had examples where judging by the
23 public record, and I'm not again trying to make any
24 personal accusations here, but judging just by the
25 public record, it appears that AECL lied to or

1 misled the regulatory agency regarding whether or
2 not they had installed earthquake-proof electrical
3 backup systems for certain pumps.

4 And as a result of this the
5 consequences were that the chairman of the
6 commission was fired, not the individuals who
7 misrepresented the facts. In other words, shoot
8 the messenger, don't punish the perpetrator.

9 Unfortunately this cannot be
10 allowed to continue. If this cozy relationship
11 between the CNSC and the industry is allowed to
12 continue, and if the message from our elected
13 representatives is that don't come down hard on the
14 proponents, then we are headed for trouble.

15 Now, we were formed -- the
16 coalition was formed in 1975, in the wake of the
17 Indian Atomic Bomb of 1974, which came as an
18 enormous shock to Canadians who had been led to
19 believe by all responsible authorities that there
20 was no link between Atoms for Peace and Atoms for
21 War, so they had been lied to. At least they
22 believe they had been lied to.

23 And then there was the
24 contamination scandal in 1975 of Port Hope where
25 all of a sudden schools and buildings had to be

1 evacuated because of tons of radioactive waste that
2 was allowed to be used by a Federal Crown
3 corporation for building purposes, even though the
4 hazards of these materials were well known ahead of
5 time.

6 And I remember Jon Jennekens, who
7 was the president of the Atomic Energy Control
8 Board at that time, made a public statement that
9 all of this waste would be gone and everything
10 would be cleaned up within one year.

11 Well, that waste is still there.
12 That waste is still there and only now are they
13 embarking on the final consolidation process, and
14 they're putting that waste in a marshy area, a
15 wetland, north of town, which is completely
16 unsuitable for long-term storage of highly long-
17 lived and toxic radioactive waste.

18 The half life of radium is 1,600
19 years. Putting it in a marshy area north of town
20 may be temporarily better than what is happening
21 today, but as a permanent solution, it's a joke.

22 So this is the problem for having
23 confidence in the regulatory agency, who simply
24 presides over this without really -- either really
25 alerting the public or the elected representatives

1 as to the potential dangers of this or cracking
2 down and saying no sometimes.

3 The shutdown of seven nuclear
4 reactors in 1997 was not the result of the Atomic
5 Energy Control Board's actions, it was the result
6 of Ontario Hydro's Board of Directors bringing in
7 Americans to tell them what's going on in their own
8 nuclear reactors because they couldn't get a
9 straight story from their own nuclear division, and
10 apparently the signals from the Atomic Energy
11 Control Board, although they were there, were --
12 they're simply not strong enough.

13 There were thousands of safety-
14 related unaddressed maintenance problems, which
15 have been allowed to accumulate, and that list was
16 growing longer every year, and yet those reactors
17 were not shut down.

18 In fact, the perception is that
19 AECB and the CNSC never refuses to grant a licence,
20 they simply say, okay. They scold and then they
21 send them out with a licence.

22 Now, we've had other things, for
23 example, the -- 500 workers recently were
24 contaminated with alpha contamination. After being
25 told by the licensee that it was perfectly safe,

1 that they didn't have to wear any protective
2 equipment or respirators, and as a result these
3 people now have plutonium in their bodies for the
4 rest of their lives probably.

5 And who was fired for this? Who
6 was fined? Who lost their job? Who lost a day's
7 pay? Was anybody taken to task? Was anybody held
8 accountable? As far as I can see, no; again, just
9 a scolding. Oh, we've got to do better, guys.
10 Like a coach. You know, this is not acceptable.

11 Especially in the wake of a
12 previous incident involving beta contamination with
13 carbon 14 dust at Pickering, where workers were
14 allowed for weeks to carry carbon 14 dust home to
15 their homes due to a lack of oversight.

16 Where is the consequences of that
17 for the industry or for the individuals who made
18 those decisions? As far as I can see, there's
19 none.

20 Recently, just a small incident
21 was a leak of -- of demineralized water into Lake
22 Ontario from a spent fuel bay that wasn't being
23 used, I gather, but even if it had been used, I'm
24 not sure if it was in use or not.

25 But the very idea that there's a

1 direct pathway into Lake Ontario from a spent fuel
2 bay is alarming to me because if you had an
3 incident where the fuel in the spent fuel bay was
4 highly damaged, then you would have a flow of
5 radioactive crap, pardon the word, directly into
6 Lake Ontario.

7 This is shocking. Why isn't it
8 going into a holding pond or some kind of reservoir
9 and not into the lake?

10 So I think that again, there's --
11 it seems that the regulatory agency is so busy, and
12 they are busy, they work very, very hard, I know
13 that, and they really spend a lot of care and time
14 on doing what they do. But they are so focused on
15 equipment and on details and on the technology that
16 they don't have time, perhaps, for the larger
17 picture.

18 And I think that we've got to have
19 a better system. We've got to have a system which
20 is genuinely accountable.

21 Yesterday we heard about checks
22 and balances. I don't see there's any checks and
23 balances, I see that it's just basically a back and
24 forth between the industry and the CNSC, and then
25 go ahead.

1 Just to mention one specific
2 example again, Dr. Greening, in one of his
3 presentations refers to a fact, a falsification of
4 safety data which he discovered and reported to his
5 superiors.

6 After one year -- the superiors
7 recognized it was falsification of data by an
8 individual. This data had been published in
9 international journals. After one year, the
10 authorities had done nothing about this to correct
11 the record, which Dr. Greening wanted them to do,
12 write to the journals and post a correction.

13 So he took it to the CNSC and he
14 wrote to the CNSC and said what had happened and
15 that his -- and the CNSC ruled, well, it's none of
16 our concern because it's not directly related to
17 licensing criteria; therefore, we do nothing about
18 it. That's the end of the story.

19 Well, it's the end of the story
20 for the issue. It's not the end of the story for
21 Dr. Greening. He was forced into retirement after
22 a 23-year career as a result of his stepping out of
23 line.

24 So I think that is really serious
25 and unless we have some genuine accountability of

1 the regulatory agency, we're not going to have a
2 possibility of having a safe nuclear industry in
3 this country going forward.

4 I think the Fukushima disaster has
5 to show us that, you know, there are limitations to
6 technology.

7 Of course, technology is
8 wonderful. Of course, there are very ingenious
9 devices and all this planning and so on, but you
10 have to ask the question, what happens when it goes
11 wrong? Where is your back-up? Where is your
12 ability to respond?

13 And it doesn't help when the CNSC
14 fails to follow one of its legal obligations under
15 the law which established it, which is, and I
16 quote:

17 "Disseminate objective
18 scientific and technical
19 information regarding the
20 hazards of nuclear
21 technology."

22 They do not do this at all.

23 If you go on their website, you
24 will find no explanation of what a meltdown is; no
25 explanation of what alpha radiation is in terms of

1 human health, in terms of what it does to human
2 beings, in terms of why it is, in some ways, more
3 dangerous than gamma radiation and beta radiation.

4 There's nothing on the website
5 which really will help workers, atomic workers, to
6 go and educate themselves about the differences
7 between different types of hazards on the job.
8 It's not there.

9 Instead, what we get from the CNSC
10 is what I can only describe as public relations
11 propaganda defending the nuclear industry and
12 denying dangers of low-level radiation. I don't
13 think this is the job of the CNSC, to deny these
14 dangers.

15 I think they should be informing
16 people about these dangers, explaining what those
17 dangers are in scientifically correct, ways not
18 partial meetings, precisely that, partial.

19 If you give partial information,
20 then basically you're misleading people and,
21 unfortunately, the CNSC does this publicly, and I
22 think really this has got to stop.

23 But more importantly than that,
24 there has to be some accountability mechanism. The
25 CNSC, for example, why is the CNSC reporting to the

1 Minister of Natural Resources, the very minister
2 who is responsible for promoting nuclear power and
3 uranium mining, rather than some other minister?

4 There's only one voice at the
5 table, the Cabinet table, about nuclear power and
6 that's the voice of the man who is promoting it,
7 the Minister, because that's his job.

8 I think that these things have to
9 stop. Why does the CNSC not have a cadre of really
10 well-respected, independent biomedical people who
11 are able to deal and educate the public and the
12 politicians about the biomedical aspects of this
13 industry?

14 Because you see what's happening
15 in Japan right now; what used to be a technological
16 problem as to how to have the safety systems
17 working, how to have the inspections, how to have
18 the measurements, it has a biomedical problem. It
19 has become an ecological problem.

20 Where are the experts to deal with
21 that, who are knowledgeable enough to deal with
22 that properly?

23 So I do think that this is why the
24 CCNR was founded, and I don't believe there has
25 been any fundamental correction to these problems

1 in the more than 30 years that we have been in
2 operation and trying to call attention to these
3 difficulties.

4 I'd just like to add one more
5 final thing, Mr. Chairman, because I realize my
6 time is probably up ---

7 CHAIRPERSON GRAHAM: You're about
8 five minutes over ---

9 DR. EDWARDS: Yes.

10 CHAIRPERSON GRAHAM: --- but I do
11 appreciate your statements; so if you could sum it
12 up as quickly as possible.

13 DR. EDWARDS: Yes.

14 I just wanted to leave -- I don't
15 know what the mechanism is but I have four pages
16 here from four different public documents, Canadian
17 documents, on core meltdowns in CANDU reactors.

18 And I would like to post this to
19 give this to panel and I would like to ask, why
20 isn't this kind of information on the website of
21 the CNSC?

22 Now, they can qualify it. They
23 can explain that we have all these safety systems
24 and so on, but why deny that these problems exist?
25 Why not educate people to what these problems

1 really are?

2 Other bodies have done it, and the
3 CNSC is the one who is supposed to be doing it.

4 Thank you.

5 CHAIRPERSON GRAHAM: Thank you
6 very much, Dr. Edwards, much appreciated for your
7 comments.

8 I will go to panel members for
9 comments -- or pardon me, for questions to the
10 presentation, and I'll go first to Mr. Pereira.

11 --- QUESTIONS BY THE PANEL:

12 MEMBER PEREIRA: Thank you, Mr.
13 Chairman.

14 I have no questions or comments.

15 CHAIRPERSON GRAHAM: Madame
16 Beaudet?

17 MEMBER BEAUDET: Thank you, Mr.
18 Chairman.

19 There is a proposal that there
20 should be a Royal Commission to evaluate nuclear
21 energy in Canada.

22 I don't think you need a PhD to
23 observe, even now, the profound divide between the
24 pro and cons of nuclear -- the nuclear industry.
25 Probably need more truth and reconciliation

1 commission than a Royal Commission.

2 I'd like to have a little bit of
3 your expertise. There are possibilities of
4 research -- and I'd like to hear you about this --
5 in trying to reduce emissions, trying to reduce
6 pollution.

7 Even if it's to re-use whatever
8 you collect, I mean, we've seen that in other types
9 of waste being done.

10 There seems to be more research in
11 trying to make the reactors safer and safer and
12 safer.

13 Is it lost in the translation that
14 there are other aspects? Is it because there's no
15 budget? Is there any research? I mean, is there
16 any progress?

17 I'd like to hear from you about
18 this, please?

19 DR. EDWARDS: Well, from my
20 perspective and from the perspective of our
21 organization, there has been, in Canada, an
22 unfortunate virtual monopoly of expertise in the
23 nuclear field within the nuclear industry and the
24 CNSC which seems, as I say it may be an
25 exaggeration, but in order to communicate quickly

1 the idea, it seems almost like a state within a
2 state, that there's very little that goes on
3 outside this.

4 Unless it is commissioned by the
5 nuclear industry or commissioned by the CNSC, very
6 little research gets done. And in the past, the
7 CNSC and the Atomic Energy Control Board -- I'll
8 give you an example, in fact.

9 The Atomic Energy Control Board
10 did commission an independent study on alpha
11 radiation, partly in response to my testimony of
12 1978 about the dangers of radon gas, which at that
13 time were seriously underestimated; now they have
14 been revised upwards.

15 But when that study was done, and
16 I can send you the document in question, the CNSC
17 dismissed it because they didn't, in my view --
18 this is the Atomic Energy Control Board, sorry, not
19 the CNSC -- in my view, the reason they dismissed
20 it was because it didn't agree with the statements
21 they had been making about the relative
22 harmlessness of radon gas.

23 At that time, the representatives
24 of the Atomic Energy Control Board were publicly
25 stating, even in sworn testimony before Royal

1 Commissions, that a 120 working-level months was
2 completely safe.

3 We now know that that's wrong and
4 I don't think anybody in the CNSC would say that
5 today, but that's what they were saying then.

6 And when they got this document,
7 very good document in my opinion, very
8 scientifically conducted by very competent people,
9 they simply dismissed the results.

10 That's the problem. The problem
11 is that we have this monopoly and we have also a
12 monopoly on public funds. The public funds,
13 billions and billions of dollars have gone into the
14 nuclear industry.

15 Another example, the Seaborn
16 Commission, which was an excellent environmental
17 assessment panel and which was not, you know, did
18 not have representatives from the regulatory agency
19 or from industry.

20 And I think it was a model of a
21 good environmental assessment panel because of its
22 constitution, a truly objective -- able to take a
23 truly objective view because of not having prior
24 commitments -- committed views about nuclear power
25 or about the regulatory agency.

1 They came up with a proposal
2 unanimously that the nuclear waste program in
3 Canada, the high-level nuclear waste program, must
4 be put in the hands of an agency which is at arm's
5 length from the nuclear industry.

6 Now what the government has
7 instead done is created an agency called the
8 Nuclear Waste Management Agency which is totally
9 owned and run by the nuclear industry. The only
10 board members of that agency are the producers of
11 the nuclear waste.

12 This is the problem. We, in
13 Canada, are operating -- we're almost willingly,
14 wilfully, blinding ourselves to the possibility
15 that something could go badly wrong and that we
16 shouldn't be putting all our eggs in one basket.

17 That's my point.

18 MEMBER BEAUDET: Thank you.

19 Thank you, Mr. Chairman.

20 CHAIRPERSON GRAHAM: Thank you,
21 Madame Beaudet and Mr. Pereira, and especially you,
22 Dr. Edwards.

23 Thank you very much for your
24 presentation this morning and it's always good to
25 hear your views and hear what you have to say. So

1 thank you very much and have safe travels.

2 DR. EDWARDS: Thank you, sir.

3 CHAIRPERSON GRAHAM: Next on the
4 agenda this morning is a presentation from an
5 intervenor, Mr. Paul York. And that is found under
6 PMD11P1.166.

7 And, Mr. York, the floor is yours,
8 sir? And if you have overheads, we'll have to
9 connect up, you don't have no -- okay, very good.

10 MR. YORK: All right.

11 CHAIRPERSON GRAHAM: Microphone,
12 you have it there and not -- identify yourself each
13 time, just for the transcripts, would be
14 appreciated.

15 --- PRESENTATION BY MR. YORK:

16 MR. YORK: Oh, right? Okay, I'm
17 Paul York. I'm a fourth-year doctoral candidate in
18 the centre for the study of religion at the
19 University of Toronto.

20 And I should disclose also that
21 I'm an environmental activist and that's what
22 prompted me to come here, but I am writing on the
23 ethics of nuclear energy in my dissertation and I
24 thought that it would be important to share some
25 thoughts from that, in particular from a book that

1 One of the -- there's other
2 authors who take issue with it and compare it to
3 gambling, and I'll explain that. And gambling with
4 human life and ecological integrity.

5 You know, the essential issue is
6 that the benefits of nuclear energy cannot be
7 justified ethically when compared to human lives
8 and to environmental integrity. So the risk
9 management calculus is flawed fundamentally. And
10 regulatory committees like this need to question
11 it.

12 Another thought that I want to
13 share and I probably won't have time for all this,
14 but I'm just sort of giving you an outline is Ian
15 Barbour's -- from Ian Barbour's book, which
16 is -- what is the title? *Ethics in the Age of*
17 *Technology*.

18 And he provides a very interesting
19 critique of regulatory committees and the problems
20 that you would be -- the ethical bind that you're
21 in in a sense because your ethical -- regulatory
22 committees is within a society committed to
23 technological progress and endless economic growth
24 are -- you know, find themselves in an impossible
25 situation because they're operating within in a

1 paradigm, which Professor Schmidt calls the
2 enlightenment faith in technological progress. And
3 he borrows that from the philosopher, George Grant.

4 And the problem with that
5 enlightenment faith, as it's called, is that it
6 doesn't set any limits on technological advances.
7 It's been -- it can reasonably be compared to an
8 irrational faith and based on a dysfunctional
9 cosmology. And I borrow the term functional or
10 dysfunctional cosmology from the author, Thomas
11 Berry.

12 And we -- the irrationality of
13 that cosmology, you know, predicated on endless
14 economic growth and technological progress without
15 limit -- without consideration of the limits of
16 nature and the limits that should be imposed on
17 human behaviours and certain technologies that
18 should eliminate certain technologies and not try
19 to manage them, because they're unmanageable
20 certainly comes to light in -- when we see nuclear
21 accidents or problems such as global warming.

22 What's interesting is that the
23 technological faith, rather than trying
24 to -- rather than trying to -- you know,
25 questioning the paradigm that it's operating within

1 seeks other technological fixes, so the -- in a
2 sense the entire nuclear industry has been, you
3 know, one thing after another have been trying to,
4 you know, fix and manage.

5 And in this management mindset,
6 you know, the reduction of ethics to risk
7 management is not only just, you know, relating to
8 the technologies in question, but it's relating to
9 the way in which public concern is managed too.

10 And so in a sense this entire
11 hearing is a risk management, public relations
12 exercise or a -- I don't know, you know, I actually
13 don't know the details of this hearing, but
14 I -- I've -- but certainly the -- the commission
15 that Dr. Edwards was just critiquing is and
16 these -- and it has to be -- we have to step back
17 from the -- from the -- you know, and see the
18 bigger picture that's happening here.

19 Now, what are -- if that is the
20 bigger picture, what are -- you know, then I'm
21 going to lead to the next point and again I'm
22 outlining it because I don't -- I probably won't
23 have time to get into the details, but what are the
24 solutions? And, you know, how do we step outside
25 the dominant paradigm that we're within?

1 And I rely in that respect on the
2 thought of Ursula Franklin, some have you might
3 have read her book, *The Real World of Technology*.
4 It's a very short, easy to read really important
5 book.

6 And in it she outlines several
7 criteria for distinguishing between technologies
8 that we ought to adopt and not adopt.

9 And so, you know, she's not --
10 she's a scientist herself, so she's not advocating
11 -- you know, regress to a primitive society, she's
12 saying we have to set limits in criteria for
13 technologies that are acceptable or not acceptable.

14 And I think regulatory commissions
15 like this are -- it's perfectly within your, you
16 know, mandate to do that. And to say no to certain
17 technologies, not just merely, you know, look at
18 how to manage them or manage a public concern over
19 them.

20 So one of the -- two of the
21 criteria is that I think are relevant for nuclear
22 energy, and she does specifically address it, is
23 that a technology would be acceptable ethically if
24 it is -- if it's reversible.

25 And nuclear technology is

1 not -- it is irreversible in a sense because of the
2 waste issue that hasn't been resolved despite, you
3 know, a public relations campaign to the contrary.

4 And the -- the other criteria that
5 I think is very relevant is that we should not be
6 adopting a -- any technologies that cannot -- the
7 results of which cannot be predicted beyond three
8 generations. And in the case of nuclear, we're
9 talking many more generations, thousands of years
10 actually.

11 So ethics is not about risk
12 management, it's not about utilitarian costs,
13 benefit analysis, it's about setting limits and
14 saying no to certain technologies because they are
15 inherently problematic ethically. I'm not trying
16 to manage things.

17 And E.F. Schumacher in *Small Is*
18 *Beautiful*, a really excellent book talks about
19 intermediate technologies and that we need -- you
20 know, so an intermediate technology in this context
21 I would say, well, you know, let's talk about
22 energy.

23 There's a fire, then there's a
24 nuclear power plant and a coal power plant on the
25 other end of this spectrum, and then in between

1 there's maybe a decentralized intermediate
2 technology like a wind turbine that, you know,
3 doesn't have the catastrophic -- potentially
4 catastrophic problems of nuclear energy or coal
5 fire power plants, but is, you know, operational
6 within a technical -- you know, a society that's
7 already committed to some degree to technology. So
8 I think -- and other authors talk about
9 intermediate technologies.

10 I got into this issue four years
11 ago because I read a report called "Renewable is
12 Doable," and that struck me, and some of you might
13 be familiar with it. I think the Pembina Institute
14 came out with it, saying how it's possible that
15 wind technology, in Ontario we -- 100 percent of
16 the energy in Ontario could be renewable.

17 And at the time the government was
18 very committed to nuclear power, it still is, and
19 it struck me, it caused me to ask why are we going
20 down the path of nuclear technology when it has all
21 these problems, and when in Ontario there's such
22 enormous wind power potential.

23 So the answer is -- what I have
24 been struggling with actually for a few years is
25 trying to answer that. And I -- Professor

1 Schmidt's book has been very useful in doing that,
2 and I have submitted a copy of his essay to this
3 commission.

4 So I'm just going to read a few
5 parts here, and get as far as I can. Okay, first
6 of all:

7 "If we follow the procedure
8 of the nuclear establishment
9 in the consideration of
10 reactor accidents, such
11 calculations might be
12 performed using a fault tree
13 analysis. A risk of
14 ecological disaster could be
15 weighed against the benefits
16 that will be received from
17 the society if nuclear future
18 is realized."

19 So this is what the cost benefit
20 ratio -- analysis is talking about.

21 So another way of expressing it is
22 the harms or destructions of good are listed on one
23 side as the costs, and the goods are listed on the
24 other side as the benefit, each column is added and
25 the costs are subtracted from the benefits, fine.

1 He says when such calculations are
2 carried out, even in a rough way, it becomes clear
3 that the benefits of nuclear energy will accrue to
4 three or four generations, while the risks will be
5 borne by somewhere between 17 and 8,000 generations
6 of human beings into the far distant future.

7 How could such a risk/benefit
8 calculation lead to the conclusion that the nuclear
9 option is a good one?

10 That's operating within the risk
11 calculus. But then he, Professor Schmidt,
12 questions that calculus in various ways, and I
13 think that's -- so quoting, E.F. Schumacher says:

14 "No degree of prosperity
15 could justify the
16 accumulation of large amounts
17 of highly toxic substances
18 which nobody knows how to
19 make safe and which remain an
20 incalculable danger to the
21 whole of creation for
22 historical or even geological
23 ages. To do such a thing is
24 a transgression of life
25 itself, a transgression

1 infinitely more serious than
2 any crime perpetrated by man.
3 The idea that a civilization
4 could sustain itself on the
5 basis of such a transgression
6 is an ethical, spiritual and
7 metaphysical monstrosity..."
8 -- and so forth.

9 And the -- a key point here is
10 Professor Schmidt's -- oh, no, quoting Barry
11 Commoner, he says that to -- you know, to rely on
12 this cost benefit analysis is to make a misleading
13 comparison.

14 No valid comparison can be made
15 between the risks of personally tragic individual
16 events like auto accidents, he did give an example,
17 or nuclear accidents, and the risks of operating a
18 device which has the acknowledged designed
19 capability, however improbable, of killing tens of
20 thousands of people at once. Commoner's conclusion
21 was that the risk was too great.

22 And then a critic -- a Canadian
23 critic of the nuclear program, Fred Knelmann, drew
24 the same conclusion, no matter how small the
25 probability of an accident, the risk is still too

1 large to be acceptable to the present or future
2 generation. So only zero risk would be socially
3 acceptable.

4 Another good point the professor
5 makes is that really by entertaining the idea that
6 we should or could have nuclear energy, we have
7 entered into a Faustian bargain.

8 The scale -- an excellent point
9 made by Zygmunt Bauman is that the scales of the
10 possible consequences of human actions have long
11 outgrown the moral imagination of the actors.

12 Knowingly or unknowingly, our
13 actions affect territories or times much too
14 distant for the natural moral impulses which
15 struggle in vain to assimilate them.

16 What he's driving at is what is
17 often referred to as intergenerational ethics, and
18 that was Franklin's point, that we -- we can't --
19 it's not morally acceptable to put future
20 generations at risk.

21 And I heard an excellent
22 presentation from Dr. Edwards at university a few
23 years ago in which he was talking about the -- and
24 maybe he can elaborate on this more if there's a
25 chance, the problem of nuclear waste and its

1 accumulation in these reactors.

2 And to say yes to more reactors,
3 or even to say yes to the existing reactors, you
4 know, and to refurbish them as though that were
5 okay is to -- and to not decommission them and look
6 at ending them, as I think I believe Germany has
7 done recently, you know, questioned them seriously,
8 is to -- is to enter into that -- continue entering
9 into that Faustian bargain in which lives are
10 traded away.

11 And that brings me to, you know, a
12 critique of gambling. And it is both Zygmunt
13 Bauman and Hans Jonas who compare the reduction of
14 ethics to -- technique to gambling. It's an all or
15 -- the risk management/cost benefit analysis is an
16 all or nothing wager.

17 This is certainly true in -- with
18 the decision to create nuclear weapons on the
19 gamble that we won't use them, or that the doctrine
20 of mutually assured destruction will work, and the
21 decision to continue with a fossil fuel based
22 economy after learning of its potentially
23 catastrophic effects vis-à-vis global warming.

24 Certainly the high stakes
25 financial industry has also been compared to

1 gambling as well. It too utilizes technique in the
2 hands of a few experts, who themselves do not pay
3 attention to the ultimate price when they lose a
4 wager, while their victims have no say in the
5 wagers which affect them.

6 Governments that invest in nuclear
7 energy are -- take the same risk and are liable to
8 the same critique of gambling. The probability of
9 accident is low, but the cost is incalculably high
10 according to Schmidt, so it is morally perverse to
11 gamble with lives in this way.

12 A more ethically justifiable view
13 is that life has an incalculable worth and that we
14 have an unconditional duty to protect it and to, in
15 the word -- you know, in the ethic of Albert
16 Schweitzer, to have a reverence for life.

17 The gambling ethic is
18 incommensurate with this. In a way we could say
19 that technique, or in the technological approach is
20 de-humanizing. It represents a dysfunctional
21 cosmology, as I noted before. And what is a
22 functional cosmology; one that takes the earth into
23 account, takes future generations into account.

24 I rely very much in most of my
25 theses on the thought of Immanuel Kant, whose

1 categorical imperative centers around the idea of
2 universalizability. And that means -- and I think
3 this is a key concept for intergenerational ethics.

4 Universalizability means the
5 importance of considering the wellbeing of
6 everybody and not trading off the interests of some
7 for the interests of others, which is more the
8 utilitarian calculus.

9 I just want to -- these are just a
10 few words from Ian Barber about the problems that
11 you, in particular, face as people who are, you
12 know -- you know, probably have a good -- you know,
13 a sense of good morality and so on, but you're --
14 you're within a system which forces you in a sense
15 to make these incredibly difficult decisions
16 because the system is the dominant paradigm, is --
17 is, you know, as I noted before, the enlightenment,
18 faith and technological progress at any cost.

19 And so Ian Barber talks about the
20 interlocking structure of technologically-based
21 government agencies and corporations, sometimes
22 called the techno-complex; it's broader than the
23 military industrial complex.

24 Many companies are virtually
25 dependent on government contracts. The staff in

1 many regulatory agencies, in turn, are mainly
2 recruited from the industries they're supposed to
3 regulate.

4 Particular legislative committees,
5 government agencies and industries have formed
6 three-way alliances to promote such technologies as
7 nuclear energy or pesticides. The networks of
8 industries with common interests form lobbies of
9 immense political power.

10 I'm sure some of the lobbyists are
11 in this very room. The -- this is the -- this is
12 the difficulty.

13 And then, you know, I -- I
14 recently did a paper on carbon sequestration and
15 one of the noteworthy things was the -- the
16 proponents of carbon sequestration were unwilling
17 to take into account the -- the risk of the gas
18 being leaked in -- in the case of an earthquake,
19 and this was in California, where a pilot project
20 was being done and it was along an earthquake
21 fault.

22 And, you know, once it leaks to
23 the surface, it could, you know -- and this is
24 being promoted in the name of -- of sustainability.

25 David Orr, in his book "Ecological

1 Literacy," talks about -- distinguishes between two
2 types of sustainability; technological
3 sustainability and ecological. And technological
4 again is that -- operating within the paradigm of
5 technological progress. And that's a paradigm that
6 we've been living within for maybe a couple of
7 centuries.

8 It's often -- you know, René
9 Descartes is often blamed for it. But now I think
10 we've really reached some kind of threshold in the
11 last 30 years where we really have to question with
12 -- you know, with global warming, the evident
13 problems of nuclear energy. We have to question
14 that paradigm and you're not powerless in this.

15 You actually have the ability to
16 be moral decision makers; every person does.
17 You're not powerless agents within some sort of
18 overwhelming techno-complex. You -- you're --
19 we're within that, but you have also the power to
20 say no to certain things and to, you know, opt out
21 of the Faustian bargain.

22 And that -- that's a thought that
23 I -- I think is very important -- called the moral
24 law within and that each -- each individual -- each
25 rational being is a -- is a -- is a moral -- is a

1 law-giver themselves.

2 And the -- the moral law, you
3 know, is -- is one about -- it requires that we do
4 set limits on our behaviour and through our
5 decision making that takes into account the
6 wellbeing of all, that concept of universalized
7 ability.

8 So it's not a hopeless situation.
9 We have at any time the possibility of stepping
10 outside or -- or moving beyond, you know,
11 overwhelming and dominant paradigms of -- that
12 require us to trade away life and -- and enter into
13 morally perverse situations. We have that
14 opportunity at any moment as individuals and as a
15 society as a whole, so it's not a hopeless thing.

16 I'm going to read a little quote
17 from -- again from Professor Schmidt:

18 "Human beings have generally
19 understood this much. If you
20 do not know the water is
21 safe, do not drink it.
22 Surely you can say if you do
23 not know whether dumping a
24 toxic chemical into a stream
25 will contaminate the drinking

1 water, do not dump it."

2 What he's getting at is the ethic
3 of limitations.

4 Again, if you do not know whether
5 the human community won't be able to safely store
6 nuclear waste for a thousand years, do not produce
7 the waste.

8 If you cannot know with certainty
9 that the effects of an industrial process will not
10 be disastrous, don't subject those who may be
11 living in the distant future to that risk.

12 So ethics involves setting limits
13 to what human beings may do in the world. It's not
14 about risk management. Risk management is the --
15 he calls it the end of ethics because it's -- or
16 the reduction of ethics -- gambling as Bauman puts
17 it.

18 CHAIRPERSON GRAHAM: Mr. York, you
19 have about three minutes to sum up, please.

20 MR. YORK: Yeah, okay.

21 Well, I would just sum up by -- I
22 think I've pretty much said what I had to say. I
23 would just urge you to listen to the voices of Dr.
24 Edwards and others who have -- who have made a
25 really relevant case here today and throughout

1 these hearings.

2 And -- and to remind you that you
3 have the -- you do have the ability to say no and
4 that is -- that is a right that each individual has
5 regardless of their -- whatever their commitments
6 or positions.

7 And we see that the people
8 exercise the moral law and make the right
9 decisions, you know, throughout history, a few
10 courageous people and it's -- it's important to --
11 at a time when human beings are -- humanity is
12 facing global catastrophes to -- to rise to the
13 occasion and -- and say no to -- to the dominant
14 paradigm that we've been living within for quite a
15 long time, but which has proven essentially
16 unworkable, dysfunctional.

17 And the -- and not simply try to
18 seek one more technical fix which won't work, but
19 to rather set limits on our behaviour. I think
20 that's my main point. Thank you.

21 CHAIRPERSON GRAHAM: Thank you
22 very much.

23 Before I go to the intervenor,
24 just one bit of clarification.

25 Most of your presentation or

1 intervention was a publication by Dr. Lawrence E.
2 Schmidt ---

3 MR. YORK: Yes.

4 CHAIRPERSON GRAHAM: --- and it
5 notes that it's not for publication without
6 permission of the author. I presume that you've
7 had the permission because this now is on the
8 website and it's -- it's part -- forms part of the
9 panel.

10 You had the permission from him,
11 did you?

12 MR. YORK: Yes, I did, and it's in
13 writing and I sent it the person who is
14 administrating these hearings.

15 CHAIRPERSON GRAHAM: Okay, that's
16 very good then, just for clarification.

17 We will now go to questions from
18 the panel members and I will first go to Madame
19 Beaudet.

20 --- QUESTION BY THE PANEL:

21 MEMBER BEAUDET: Thank you, Mr.
22 Chairman.

23 I'd -- I'd like to go back to the
24 concept of reference -- of reverence for life and
25 ask you where you draw the balance. If you have

1 with the nuclear industry an accident beyond design
2 basis, it is catastrophic and it -- it's very
3 graphic and it's very saddening.

4 But if you look also at renewable
5 energy, if you look, for instance, at hydro power,
6 when you have the filling up of a huge reservoir,
7 you -- you create seismic tremors that are about
8 two on the Richter -- Richter scale. I mean is
9 that reverence for life, to have people worried
10 that suddenly, you know, there are earthquakes?

11 I was in a hearing where if the --
12 the dam would break, people within, let's say, 50
13 kilometres of the dam -- I mean there's no warning.
14 Forget it, they're gone.

15 But there was a village who had
16 calculated they had 22 hours to get ready and they
17 were asking the company to build a plateau so that
18 they could move everybody from the village; the
19 sick, the old people, et cetera. They had
20 evaluated they would have time to save everybody's
21 life.

22 Now, this is not high numbers. So
23 where do you begin or stop when you want to look at
24 reverence for life?

25 CHAIRPERSON GRAHAM: The mike on

1 and identify yourself please. Your mike is not on.

2 MR. YORK: Oh, I see. Paul York.

3 The -- clearly these large dams
4 are not -- not the type of technology that Ursula
5 Franklin or others would be talking about. She
6 distinguishes between prescriptive technologies and
7 holistic technologies and provides seven criteria
8 for distinguishing between them in her book.

9 And a holistic technology is one
10 that takes into account the natural systems and --
11 and people's lives, the reverence for life and it's
12 a decentralized and sustainable or sustainably
13 sufficient whereas a large dam is not. And I mean,
14 technically I guess it can be classified as a
15 renewable energy.

16 So when I say renewables I have to
17 qualify that and say renewables that count as
18 holistic technologies and not prescriptive
19 technologies because there's certain technologies
20 -- the prescriptive ones that -- within their very
21 design, they determine the outcome in a -- in an
22 unsustainable and unjust manner.

23 And then we're left with the
24 problem of trying to manage the problems that they
25 create as opposed to holistic technologies that

1 are, you know, much simpler, more holistic and more
2 just. I mean, so we have to make that distinction
3 between holistic and prescriptive renewable
4 technologies.

5 MEMBER BEAUDET: I haven't read
6 the book and I read part of what you've presented
7 from it, but I think every technology has a risk.
8 It should be considered more in terms of what
9 society accepts as a risk.

10 MR. YORK: Sorry, Paul York.
11 How do -- how do we get to a
12 situation where it's acceptable to trade away human
13 lives for the -- for the benefit of -- you know,
14 especially on such a scale for the benefit of
15 energy?

16 It's -- I'd really -- I honestly
17 believe that these holistic intermediate
18 technologies don't place us in that position to the
19 same degree, you know, they're on another scale
20 altogether.

21 Clearly, you know, the advocates
22 for centralized, prescriptive technologies are
23 going to defend them using any -- you know, any
24 number of rationalizations because, you know, their
25 interests are at stake, but at what point do you --

1 you say that that is absolutely, you know,
2 unacceptable and we can't continue in this way.

3 And it really requires questioning
4 this enlightened faith in technological progress
5 and that requires having an entirely different
6 world view in a sense, from the one in which our
7 society has, you know -- is enmeshed in and that's
8 a very difficult prospect for many people. But
9 that's the -- that's what we're required to do
10 morally at this time.

11 We have to explore, you know, the
12 options, the alternatives to nuclear energy, to
13 coal-fired power plants, to factory farms or other
14 manifestations of -- that are on a scale that --
15 you know, and these large dams as well, on a scale
16 that is just incommensurate with anything that is
17 morally defensible.

18 MEMBER BEAUDET: Thank you.

19 MR. YORK: Thank you.

20 MEMBER BEAUDET: Thank you.

21 CHAIRPERSON GRAHAM: Mr. Pereira?

22 MEMBER PEREIRA: Thank you, Mr.

23 Chairman.

24 Thank you very much for your
25 presentation on moral issues -- ethical issues, and

1 we've had a number of intervenors who have spoken
2 about respect for the land. Some of the Aboriginal
3 intervenors' presentations were very profound, and
4 I think society has pushed them to the fringes when
5 they had a lot to offer.

6 But I come to the core of your
7 presentation. I'll start off with where Madam
8 Beaudet left off and in looking at some of the
9 other options that you advocate; renewable energy.

10 As you come down in size of the
11 generating unit, you are reducing certain risks,
12 but beyond a certain point you are creating other
13 risks because, for instance, biomass at a certain
14 level of generation and biomass, you can have
15 fairly well-controlled emissions.

16 But as you come down in size to
17 almost an individual householder, you have
18 emissions then which would not meet environmental
19 protection standards, emissions of furans and so
20 on, which are carcinogens, like the common
21 woodstove. It's not really a very environmentally
22 friendly device from the perspective of what it
23 emits.

24 But, you know, these -- these are
25 the balances we've got to make and at what point do

1 we accept risks from energy generation options?

2 And so I -- I find your comment
3 that zero risk is the only one that is acceptable,
4 but very difficult to live with because I don't
5 think you can ever get to zero risk in life.
6 That's the challenge we face.

7 So what we're talking here to a
8 certain extent on are health risks on the impact of
9 different activities on the health of Canadians, of
10 the population of the world and with that I'll turn
11 to CNSC staff and ask whether they're aware of any
12 information that perhaps Health Canada puts out on
13 the risks that Canada accepts with respect to
14 health impacts on Canadians from different
15 industrial activities?

16 I believe that such a reference
17 probably does exist; such information does exist in
18 the Government of Canada; is that correct?

19 DR. THOMPSON: Patsy Thompson, for
20 the record.

21 I'm aware of documents that have
22 described the health risks, for example, associated
23 with drinking water standards for a variety of
24 chemicals where they present a relative risk of
25 each drinking water quality standards. And the

1 standards represent a balance between health risks
2 -- public health risks and the cost of reducing
3 levels of certain substances in drinking water.

4 So I know that information exists
5 for other practices. I'm not sure that something
6 like this would be documented.

7 What I do know is that the risk
8 assessment framework that is used by Environment
9 Canada to assess, for example, substances under
10 CEPA for either existing chemicals or new
11 chemicals, have a range of risk values that are
12 used to judge the necessity of implementing risk
13 management measures. So that framework exists and
14 it's quite well-documented.

15 MEMBER PEREIRA: Thank you. I was
16 looking for something that goes beyond that.

17 That's useful to have as well
18 because the reference I was making to woodstoves is
19 from CEPA, *Canadian Environmental Protection Act*.
20 But let me go onto what I was looking for is
21 industrial activities in Canada and whether Health
22 Canada would have anything.

23 Could this be something that you
24 could look into, an undertaking perhaps for -- to
25 seek out whether Health Canada has documented risks

1 of different industrial activities and what is
2 accepted by the Government of Canada, perhaps for
3 the provinces, for different industrial activities?

4 And, you know, this would range
5 from mining to the lumber industry to energy
6 generation. And this would be useful background
7 information for the panel and it touches on the
8 points raised by the intervenor, the risk that
9 society accepts at present.

10 And certainly, you know, we can
11 improve on that, based on the considerations you
12 bring before us. So do you wish to comment on what
13 I have just said?

14 MR. YORK: Paul York.

15 In your presentation you've, you
16 know, used the word risk management a number of
17 times and/or risk and I just want to remind you of
18 the -- sort of the main thrust of my presentation,
19 which is that perhaps we need to question that
20 methodology rather than try to, you know, compare
21 this risk versus that risk and so on.

22 And why should we question that
23 methodology or try to think outside of it? Which
24 is certainly within our capacity to do, because the
25 risk management -- the reduction of ethics to risk

1 management is -- it is like nuclear energy, yet
2 another -- it's a product of technical thinking.
3 It is technique.

4 Jacquie Ellul is one of the good
5 critics of this and I mean there is entire books
6 written on this critique of technique, this
7 mindset, this world view.

8 I mean one of the points I want to
9 make is that it leads to a kind of a moral
10 relativism as opposed to some sort of a -- more
11 absolute ethics, saying, you know -- you know,
12 which aspires to the good that it is -- you know,
13 it reduces lives to -- you know, trades away lives
14 in sort of a quantitative analysis.

15 Now, I think the decision that is
16 before you is -- is my understanding, and you can
17 correct me if I'm wrong, is that, you know,
18 your -- this hearing is about -- oh, should we
19 build more nuclear reactors in Ontario, right? Is
20 that right?

21 If it is the case, that's what
22 your -- this is about, then you have, you know,
23 once decision on the table. Shall we have more
24 nuclear reactors? And I would propose to you
25 that -- that the morally right decision is to say

1 no to that, and to question whether it is
2 acceptable to enter into even this kind of risk
3 management kind of thinking.

4 I mean, I was at the last
5 regulatory committee on this, was on tritium and I
6 spoke at that and I talked with the -- somebody
7 afterwards and he said -- the Chair and he said,
8 you know, well, we have this calculus of a million
9 to one -- one in a million people will get cancer
10 or something like that. And I thought, well, that
11 sounds fine.

12 That's a -- but, in fact, what
13 if -- you know, what if you're the person getting
14 cancer or what if it's somebody you love?

15 I mean, how can you -- how can we
16 really even trade away one person's life for the
17 benefit of an industry, which we know can --
18 doesn't really have to exist because we can get
19 power in other ways that don't -- you know, don't
20 cost lives, like, in this same way.

21 I mean, I've never heard of -- I
22 mean, okay, there are many groups that are -- you
23 know, talk against wind power, but I've never heard
24 of wind power taking people's lives. I mean, and I
25 am -- honestly I'm sceptical of some of the claims

1 of the -- of the opponents of wind power, but
2 that's another discussion.

3 The -- the fact is that if Germany
4 can build 70,000 of them and it's a smaller country
5 and we have -- you know, we have such a large
6 province and so much wind potential, why aren't we
7 at least, you know, talking about -- you know,
8 getting rid of our nuclear reactors that have so
9 many problems associated with them that -- that
10 forces to enter into these risk calculus scenarios
11 in which, you know, we have to make decisions
12 about, you know, based on who is going to get
13 cancer or who -- now or in the future.

14 I mean, these -- I think these are
15 fundamentally, problematic kinds of calculations
16 because, you know, they do lack the reverence for
17 life.

18 I just want to end by, if you want
19 to learn or get a better articulation of the -- of
20 the ethic of the reverence for life, I just
21 recommend that you look at Albert Schweitzer's
22 statement on that.

23 I didn't bring that with me, but
24 it's such a -- it's a beautiful expression of the
25 need to -- to bring a higher sense of ethics to the

1 table when we're talking about such profound public
2 policy issues.

3 MEMBER PEREIRA: Thank you, I just
4 want to --

5 CHAIRPERSON GRAHAM: Just -- Mr.
6 Pereira, I think Dr. Thompson wanted to just
7 intercede there for a second.

8 DR. THOMPSON: Patsy Thompson, for
9 the record.

10 I wanted to clarify a statement
11 made by the intervenor and it's been made in other
12 interventions. That one of the problems with risk
13 assessments is that risk management is integrated
14 into the risk assessment.

15 And I wanted to state that the
16 practice of integrating risk assessment with risk
17 management was done away with many years ago
18 because of the -- there were a number of studies in
19 the mid '80s that clearly showed that risk
20 assessments for pesticides, the risks had been
21 underestimated because of the association of the
22 supposed benefits of pesticides and because of that
23 the risk assessment frameworks that are in place in
24 Canada and many other countries separate clearly
25 the risk assessment from risk management, so that

1 there is a clear assessment of risks.

2 And then the risk management part
3 comes afterwards, so there is a clear description
4 of the risks done independently of cost benefits
5 and other considerations.

6 CHAIRPERSON GRAHAM: Thank you.

7 Just one thing, Mr. Pereira,
8 before I start, did you want that as an undertaking
9 to get that information?

10 So we'll give that number 61 and
11 that will be to CNSC to see if they can get that
12 information either from the Department of Health or
13 other government agencies. So that's number 61 and
14 we'll put it down for next Wednesday to report back
15 when you may be able to give us that information
16 and when it's forthcoming.

17 CHAIRPERSON GRAHAM: Mr. Pereira?

18 MEMBER PEREIRA: I just want to
19 come back on some comments you made concerning the
20 role of this panel.

21 This panel has not been mandated
22 to make a decision on the need for nuclear reactors
23 as such. That decision is made by the Government
24 of Ontario and they held public consultations on
25 the matter.

1 What we are looking at is if
2 Ontario Power Generation were to proceed with the
3 construction of new nuclear reactors, would the
4 environmental impact be significant or would there
5 be significant impacts that would warrant
6 mitigation or even prohibition of certain aspects
7 of the project? So that's what this is -- we were
8 primarily charged with.

9 And that is what the -- our
10 mandate applies to. There were guidelines issued,
11 prepared and issued with public consultation before
12 we were appointed, so it is within the framework of
13 the *Canadian Environmental Assessment Act*. We have
14 a slightly different mandate from what you -- you
15 seem to imply in your comments.

16 MR. YORK: It's about
17 environmental impact; is that right? Okay, well,
18 the -- that -- I should have looked that up before
19 I came here.

20 I was talking about human lives,
21 but definitely the same arguments apply if we --
22 yeah, there is a distinction between environmental
23 ethics between an anthropocentric point of view and
24 an ecocentric point of view that, you know, where
25 we place value in nature or in human beings.

1 And I think of the best, you know,
2 argument is that they're consistent and we see
3 that. That there is no, you know, serious
4 distinction that could be made and so therefore,
5 you know, it's in the -- it's in the interest of
6 human beings to protect the environment.

7 It's in the interest of the
8 environment to protect the environment and to
9 respect life in that form too. It has an intrinsic
10 value.

11 MEMBER PEREIRA: Can I interrupt?

12 MR. YORK: Yeah.

13 MEMBER PEREIRA: I don't want to
14 give the impression that human health is not part
15 of our deliberation. It's human health and the
16 environment, so human health is part of it, but
17 we're not looking at the choice of nuclear waste as
18 renewables, we're looking at if nuclear were to be
19 built, would it be acceptable from the perspective
20 of protection of human health and the environment?

21 MR. YORK: Okay. Sorry, I was
22 mixed up on that, but the -- I will just
23 remind -- I want to just remind you about the part
24 of my presentation then that I do think pertains to
25 that which is to question the thinking that would

1 suggest that we can manage or fix environmental
2 problems that arise from the technologies, such as
3 nuclear technology, centralized prescriptive
4 technologies, and, you know, to look further into
5 that, look into David Orr's Ecological Literacy, he
6 has a very serious critique of technological
7 sustainability, as he calls it, and that mindset,
8 and I think that is relevant here.

9 So undoubtedly you will hear
10 presentations that, you know, we can control or
11 properly manage radioactive waste or the
12 possibility, you know, that the CANDU reactors are
13 safe or something along those lines and that there
14 is limited risk.

15 And so I mean there are two ways
16 of looking at that: first, you know, should we not
17 be questioning the risk/management thinking? And
18 secondly, should we not be questioning the thinking
19 that leads to technological sustainability?

20 So those are the two paradigms
21 that some of the other speakers here will be
22 operating within, and I would just ask you when you
23 hear them to question those manners of thinking and
24 to try to think outside of those paradigms, that's
25 all.

1 Thank you.

2 CHAIRPERSON GRAHAM: Thank you,
3 Mr. Pereira.

4 OPG, do you have any questions of
5 the intervenor?

6 MR. SWEETNAM: No questions.

7 CHAIRPERSON GRAHAM: CNSC?

8 DR. THOMPSON: No thank you.

9 CHAIRPERSON GRAHAM: Government
10 agencies, which I see none, and Mr. Kalevar.

11 --- QUESTIONS BY THE PUBLIC:

12 MR. KALEVAR: Kalevar from Just
13 One World.

14 I had some chance to look at the
15 transcripts that you are preparing. I just wanted
16 to bring to your attention that my name has been
17 misspelled. I would appreciate it if it is
18 corrected. It is K-A-L-E-V-A-R. Okay.

19 I also checked Dr. Caldicott's
20 presentation and here is a direct quote from her
21 presentation which I bring to your attention.

22 CHAIRPERSON GRAHAM: Mr. Kalevar,
23 if you would supply that to the Secretary if in
24 fact there are any corrections and they will note
25 it in synoptics, please, anything that maybe need

1 to be corrected as far as spellings or anything, it
2 would be appreciated.

3 You question to the intervenor,
4 please?

5 MR. KALEVAR: Yes, it is based on
6 this quote:

7 "...tritium is so active that
8 nothing prevents it getting
9 out except gold..."

10 "Gold is so dense that
11 tritium cannot escape."

12 This is a direct quote.

13 I don't know if you saw it on the
14 web, Mr. Presenter, if this is - I am sure you know
15 that tritium is quite dangerous to the uterus and
16 the placenta and certainly you don't want it to get
17 out of the nuclear station.

18 Would you think that that would
19 mean that the whole station has to be gold-plated
20 to keep the tritium in?

21 CHAIRPERSON GRAHAM: That is your
22 question?

23 MR. KALEVAR: That is my question
24 to the presenter.

25 CHAIRPERSON GRAHAM: That

1 question, I think you have asked that before ---

2 MR. KALEVAR: And I didn't get an
3 answer.

4 CHAIRPERSON GRAHAM: Well, we
5 don't have an answer for that, sir, because I don't
6 think -- I think it is beyond the realm of
7 possibility. And the intervenor I don't think can
8 answer that also. He has made his statement, so
9 ---

10 MR. KALEVAR: I would like to take
11 an undertaking from the CNSC that they would look
12 into it and give us a rebut to Helen Caldicott's
13 statement or accept the fact that to feed the
14 tritium in they have to gold plate the whole
15 station.

16 CHAIRPERSON GRAHAM: Mr. Kalevar,
17 we take every intervenor's statement under
18 consideration before we make a decision, and that
19 -- if she made it, which she did make, I remember
20 her making that statement, all those interventions
21 are read and considered as we make our decision.
22 So yes, the answer is: all decisions are
23 considered.

24 Thank you very much.

25 MR. KALEVAR: This one needs to be

1 rebutted though.

2 CHAIRPERSON GRAHAM: We will now
3 declare a 15-minute break and will return at 10:40.

4 --- Upon recessing at 10:26 a.m. /

5 L'audience est suspendue à 10h26

6 --- Upon resuming at 10:43 a.m. /

7 L'audience est reprise à 10h43

8 CHAIRPERSON GRAHAM: Thank you,
9 and welcome back.

10 The next intervenor that we have
11 this morning is an intervention by Ms. Jacklin and
12 it's under -- Lynn Jacklin I should say -- and it's
13 under PMD 11-P1.193.

14 Ms. Jacklin, the floor is yours.
15 Welcome. You may proceed.

16 --- PRESENTATION BY MS. JACKLIN:

17 MS. JACKLIN: Thank you.

18 My name is Lynn Jacklin and I live
19 in Whitby between the two nuclear power plants and
20 I've been concerned about the daily release of
21 tritium into the air and the water in the area that
22 I live in here.

23 I'm presenting out of concern for
24 the health of my community and that of our
25 grandchildren.

1 I'm requesting that the panel stop
2 the building of Darlington for environmental and
3 health concerns.

4 I first became aware of the
5 nuclear industry when I saw a National Film Board
6 film, I believe put out by Rosalie Bertell, about
7 the schools in Port Hope on top of the nuclear
8 waste and was quite shocked by that.

9 Later, I happened to meet the
10 author of the book called Nuclear Family and I've
11 forgotten the -- the woman's first name was Jo Ann
12 and I forgot to check her last name. I believe it
13 was Burgess but I'm not sure; I'll have to get back
14 to you on that one.

15 Her husband worked in the nuclear
16 industry and he was exposed to radiation, I believe
17 dust, and he died of a lung cancer shortly after.
18 I believe it was for the Eldorado industry and the
19 industry didn't take any responsibility for that.

20 So I was quite shocked at having
21 had this personal experience of having met with her
22 as well as reading her book.

23 Further to that, I saw the film
24 "If You Love this Planet" by Helen Caldicott and I
25 realized how the nuclear industry was involved in

1 producing the fuel for nuclear weapons and such,
2 and then I also read Rosalie Bertell's on No Need
3 for Nuclear, and have been subscribing to the
4 newsletter from the International Institute of
5 Concern for Public Health for quite a few years.

6 The presentation -- I have
7 permission from Marion Odell of the International
8 Institute for Public Health to present her article
9 of February 1st, 2010 as the basis of my report.

10 She wrote Low-dose Radiation in
11 Great Lakes Water System, A Serious Health Hazard
12 was the title.

13 On January 27th, a leading headline
14 in many newspapers across Canada reported a spill
15 of tritium from the Atomic Energy of Canada, AECL,
16 nuclear reactor that produces medical
17 radioisotopes.

18 News reports said that there was
19 no health threat after the aging reactor had
20 released radioactive tritium into the air on
21 December 5th, 2008.

22 Later, the public found out that
23 another part of the reactor had sprung a leak of
24 "slightly radioactive water", their quote. Seven-
25 thousand (7,000) litres a day were spewing out and

1 this was going on for 6 weeks.

2 In order to keep the reactor
3 going, the tritium-contaminated leaked water was
4 replaced, ending up in the Ottawa River.

5 The CNSC, the Canadian Nuclear
6 Safety Commission, said that the water leaking from
7 the weld was, "a very low level of radioactivity"
8 and "not a matter of concern". The radioactive
9 spill, however, did provoke renewed controversy
10 over the safety of the facility.

11 Later, after a brief shutdown, the
12 reactor continued to operate producing medical
13 isotopes.

14 On March 5th, 2009, the City of
15 Ottawa reported that the Ottawa River was
16 chronically contaminated by tritium at about 6
17 becquerels per litre.

18 A following report said that low
19 levels of tritiated water were detected at the
20 mouth of the Ottawa River that empties into the
21 Saint Lawrence River.

22 The NGO Tritium Awareness Project
23 reported that an estimated 28 trillion becquerels
24 of tritium had been released from the Chalk River
25 facility to the Ottawa River, while an estimated

1 trillion becquerels had been released into the air.

2 On March 25th, the International
3 Institute of Concern for Public Health called on
4 the authorities to heed warnings about health risks
5 from spills of tritium into air and water. Some
6 Federal politicians also spoke on the issue.

7 Gordon Edwards, president of the
8 Canadian Coalition for Nuclear Responsibility,
9 wrote a letter to the Ottawa Citizen stating that:

10 "It is deeply distressing to
11 see how the polluter, AECL,
12 and the regulator, CNSC,
13 joined forces to obscure the
14 facts and to provide
15 unscientific reassurances of
16 safety to the public and to
17 their elected
18 representatives."

19 A controversy had arisen the
20 previous year when Prime Minister Stephen Harper
21 fired the chief nuclear regulator, Linda Keen, who
22 had ordered the medical isotope reactors shut down
23 to upgrade safety systems that had been ordered by
24 the Canadian Commission but not put in place, most
25 notably water pumps.

1 The reason given for the dismissal
2 of Ms. Keen was that a huge number of people would
3 not be able to receive radioisotopes for cancer
4 treatment or medical tests because of the shutdown.

5 The reactor was re-started before
6 any upgrades were done.

7 Tritium is a radioactive form of
8 hydrogen. In the upper atmosphere, cosmic rays
9 interact with atmospheric gases to produce tritium;
10 Hydrogen-3, or the symbol T, or H-3. It occurs in
11 nature in minute quantities. Emissions from
12 military and civil nuclear facilities far exceed
13 natural sources.

14 A beta transmitter, tritium
15 combines readily with oxygen to produce radioactive
16 water, tritiated water, with a physical half-life
17 of 12.3 years.

18 Heavy water reactors such as the
19 CANDU produce larger amounts than light water
20 reactors. Beta emitters, such as tritium, were not
21 thought to cause much harm in the past, but more
22 recent science has disclosed an increased health
23 risk long suspected by some earlier researchers.

24 Tritiated water is dangerous if
25 inhaled, ingested or absorbed through the pores of

1 the skin. Radiation dose depends on the strength
2 of the source but also on the length of time a
3 person is exposed.

4 Faster growing or changing cells
5 are more vulnerable to exposure to radiation. Some
6 of the tritiated water that's absorbed becomes
7 combined with carbon in the body. This is called
8 "organically bound tritium", OBT.

9 The OBT fraction of tritiated
10 water is made up of two components.

11 One component, OBT-1, easily
12 reacts with other chemicals in the body and binds
13 with oxygen, sulphur, phosphorous or nitrogen atoms
14 to form amino-acids, proteins, sugar, starches,
15 lipids, and cell structure materials, thus making
16 them radioactive. The component has a half-life of
17 40 days.

18 The second component, OBT-2, binds
19 with carbon atoms of the DNA with a half-life of
20 about 550 days.

21 According to Dr. Rosalie Bertell,
22 it has been demonstrated by scientists that both of
23 these components occur in the body in localized
24 areas, not homogeneously throughout.

25 A major source of low-dose

1 radiation in the Great Lakes water system comes
2 from nuclear electricity power plants that are
3 situated on water courses leading into or on the
4 shores of the lakes.

5 Other sources are related to
6 industries using radioactive materials in waste
7 dumps containing radioactivity that can seep into
8 the water system.

9 Since about 1990, the
10 international research community has spent some
11 time -- has spent more time looking at lower-dose
12 rate health effects.

13 Many of these scientists have been
14 surprised to discover effects such genomic
15 instability, the bystander effect, an increase in
16 relative biological effect, RBE, mini-satellite
17 damage, and non-homogenous distribution of
18 radionuclides.

19 These effects are especially true
20 for those emitters that get inside the body such as
21 alpha and beta particles. These particles are
22 derived from natural or man-made nuclear fission.

23 These studies have revealed
24 mechanisms that explain the health effects of low-
25 level ionizing radiation and builds on the base

1 government-sponsored study of childhood cancer,
2 KIKK study, released in 2008 found that children
3 less than 5 years old living within 5 kilometres of
4 a nuclear power plant exhaust stacks had twice the
5 risk of contracting leukaemia as those living more
6 than 5 kilometres away. A significantly elevated
7 risk was also found up to 50 kilometres away.

8 Sixteen (16) nuclear power plants
9 were studied. Even though this study was carried
10 out using a superior research model and providing
11 peer-reviewed evidence, the results have been
12 ignored or disputed by some regulators.

13 According to Professor Emeritus of
14 Physics and Environmental Sciences, Rudi H.
15 Nussbaum, studies with the results contradictory to
16 those of KIKK lack statistical power to invalidate
17 its findings.

18 The KIKK study's findings add to
19 the urgency for a public policy debate regarding
20 the health impact of nuclear power generation.

21 Radioactive nuclides found in
22 Great Lakes water include tritium, carbon 14,
23 caesium and radio iodine, including the long-lived
24 iodine 129, all hostile to the human body.

25 While even naturally-occurring

1 radioactivity is a matter of health concern, there
2 is nothing we can do about it. However, we can do
3 something about stopping the increasing amounts of
4 manmade radioisotopes in our biosphere.

5 A large number of nuclear power
6 plants around the Great Lakes are admitting some
7 degree of tritium. This should be of great concern
8 to all who derive their drinking water from this
9 source.

10 Having studied the health effects
11 of low-dose ionizing radiation for over 40 years,
12 Dr. Rosalie Bertell, Ph.D. GNSH, is a leading
13 expert in that area of environmental epidemiology
14 at an international level.

15 She believes strongly that a zero-
16 based goal for manmade tritium is the only
17 acceptable goal for regulation from a public health
18 standpoint.

19 She has stated on more than one
20 occasion that she rejects the ICRP methodology for
21 calculating the internal absorbed dose from
22 inhaled, ingested and skin-absorbed tritium.

23 Exposure to the biological half-
24 life of carbon bound or fixed OBT is significantly
25 under-estimated by them.

1 In conclusion, it's imperative
2 that a continuing assessment of the levels of
3 tritium in Great Lakes waters should be done. A
4 level of tritium should be set to reduce that
5 allowed as low as possible, with the eventual
6 target being zero manmade tritium.

7 In 2008 the Ontario Advisory
8 Committee on Environmental Standards, ACES,
9 composed of medical technologists, proposed an
10 immediate guideline of 100 becquerels per litre for
11 tritium, and then within five years a guideline of
12 20 becquerels per litre of water.

13 Natural tritium in drinking water
14 was at that time estimated to be below 10
15 becquerels per litre. The late professor emeritus
16 of the University of Waterloo, Hari Sharma, said
17 that tritium was not measureable in Lake Ontario
18 prior to the large nuclear weapons test on Bikini
19 Island in the South Pacific in 1954. That would be
20 an unlikely target now.

21 The current guidelines for tritium
22 in drinking water in -- for Canada Health and
23 Welfare, are 6,000 -- I'm sorry, 7,000 limits of
24 becquerel per litre. In comparison, in the U.S. in
25 1999, they allowed only 740 becquerels. And the

1 European Union allowed 100 becquerels per litre.
2 In Colorado, they allow 18 becquerels per litre,
3 and in California, 15.

4 So you can see that Canada Health
5 and Welfare, 7,000 becquerels of tritium per litre
6 is well above what is accepted in other countries.

7 In conclusion, I'm opposed to a
8 future investment in unhealthy nuclear energy, and
9 I request that the 35 billion that would be spent
10 on that, be spent on clean renewable energy out of
11 concern for the health of our community and
12 generations to come.

13 Thank you.

14 CHAIRPERSON GRAHAM: Thank you
15 very much, Ms. Jacklin.

16 I will now open the floor to panel
17 members, and I'll go first of all to Mr. Pereira.

18 --- QUESTIONS BY THE PANEL:

19 MEMBER PEREIRA: Thank you, Mr.
20 Chairman.

21 Thank you for your presentation.
22 The issues you have raised have been also raised by
23 a number of other intervenors on concerns about the
24 health impact of doses of tritium from releases at
25 nuclear generating stations.

1 There have been a number of
2 studies that have been done, and some of them have
3 been already presented to the panel by the CNSC and
4 other agencies. But you do raise a number of
5 points that I'd like to follow-up on just to
6 increase the understanding this panel has of risks
7 that arise from exposure to tritium.

8 The first question that I'd like
9 to pose to CNSC staff concerns the risk from
10 organically-bound tritium, and related to that is
11 the adequacy of the coverage of organically-bound
12 tritium in our own regulations and also in guidance
13 that we obtained from the ICRP?

14 DR. THOMPSON: Patsy Thompson, for
15 the record.

16 Organically-bound tritium is --
17 has been studied for quite some time, and the
18 information provided by the intervenor in terms of
19 the two categories of organically-bound tritium
20 with different resonance time in the body is
21 accurate.

22 The ICRP models for dose
23 assessment do include OBT as a component of the
24 exposure and the dose, and one of the reports that
25 we have referenced in one of the undertakings

1 provides the ICRP model for OBT and HDO and how
2 it's taken into consideration.

3 Our report also mentions that
4 there are other models being developed that are
5 more -- physiologically take different components
6 into consideration and those models provide for a
7 slightly increased dose from OBT, and the
8 recommendations that we've made is that the work to
9 develop those models be continued because currently
10 the models don't exist for infants, for example,
11 and different age groups.

12 But when we have calculated doses
13 using the ICRP model and the other one is called a
14 Richardson Model. The doses are slightly
15 different, but they're not significantly different,
16 so it's -- and that information is provided in our
17 report.

18 The ICRP is -- has a working group
19 looking at those models and that's one of the
20 models that they're looking at. And Dr.
21 Richardson, who is the author of the Richardson
22 Model, is a member of that working group.

23 MEMBER PEREIRA: Thank you.

24 And then just going on from there,
25 the intervenor talked about European Committee, new

1 set of regulations or guidelines; how does that
2 relate to the work that you spoke about? Is it
3 similar -- working on similar lines or different
4 standards?

5 DR. THOMPSON: Patsy Thompson, for
6 the record.

7 I believe you're talking about the
8 European Committee on Radiation Risk. This
9 committee is -- was formed by essentially people
10 who are more in line with sort of green groups and
11 the UK Health Protection Agency reviewed the
12 recommendations from that organization and their
13 conclusions were that the scientific interpretation
14 of the studies, the epidemiological studies that
15 are made by ECRR, are not in line with
16 interpretation of scientists and the published
17 literature.

18 And what they've also found is
19 that the recommendations made by ECRR are not based
20 on science, and so there's little scientific basis
21 for the recommendations they made. They don't
22 provide scientific rationale for -- for the
23 recommendations they made.

24 But the work that the CNSC has
25 done on tritium to better understand the -- the

1 risks and to see how we can improve the models was
2 also done in the U.K. and was done in France.

3 And there's consistency in terms
4 of findings and recommendations in terms of making
5 an international study of workers exposed to
6 tritium so that we would have the numbers of -- a
7 population large enough to have a reasonable chance
8 of having a scientifically, statistically robust
9 study.

10 And so there's been consensus in
11 terms of the work that needs to be done. There's
12 also a consensus that the risks have not been
13 significantly underestimated.

14 MEMBER PEREIRA: Now, this CNSC
15 study/report that you're talking about, is this one
16 of the documents that you have already supplied to
17 the panel and is it available to the public?

18 DR. THOMPSON: Patsy Thompson, for
19 the record.

20 It is one of the documents that
21 was referenced in -- I can't remember what the
22 undertaking number is. And all of those reports
23 are available on the CNSC website.

24 MEMBER PEREIRA: And what is the
25 title of the report just in case the intervenor is

1 interested in it?

2 DR. THOMPSON: It's -- if we could
3 -- it's, Info 0799 and the title is, "*Health*
4 *Effects, Dissymmetry and Radiological Protection of*
5 *Tritium,*" and it's part of the tritium studies
6 project. So it's information 0799.

7 MEMBER PEREIRA: Thank you, Mr.
8 Chairman.

9 CHAIRPERSON GRAHAM: Thank you,
10 Mr. Pereira.

11 Madam Beaudet?

12 MEMBER BEAUDET: Thank you, Mr.
13 Chairman.

14 I think my question has been
15 partially answered, but there's a statement in the
16 submission that the ICRP considers only significant
17 health risks and we know that doesn't cover for the
18 incidence of cancer because of prevention now and
19 treatment. They list death risks and I was
20 wondering how this aspect is covered?

21 (SHORT PAUSE/COURTE PAUSE)

22 DR. THOMPSON: Patsy Thompson, for
23 the record.

24 If we could come back perhaps
25 after lunch with the exact description of the ICRP

1 risk factors because the risk consideration of
2 both, but it's not so straightforward.

3 MEMBER BEAUDET: Yes, please.

4 CHAIRPERSON GRAHAM: We won't give
5 that a number; they're going to come back right
6 after lunch with that so --

7 DR. THOMPSON: We will -- Patsy
8 Thompson, we will come back right after lunch --

9 CHAIRPERSON GRAHAM: Sure.

10 DR. THOMPSON: -- with a
11 description of the -- what is considered in the
12 ICRP risk factor.

13 CHAIRPERSON GRAHAM: That's very
14 good. Thank you.

15 Madam Beaudet?

16 MEMBER BEAUDET: Thank you.

17 My other question was already
18 covered about the European Commission.

19 Thank you.

20 CHAIRPERSON GRAHAM: Okay. We'll
21 now go to OPG; do you have any questions for the
22 intervenor?

23 MR. SWEETNAM: Albert Sweetnam.

24 No questions.

25 CHAIRPERSON GRAHAM: CNSC?

1 DR. THOMPSON: Patsy Thompson.

2 No questions, but if I could make
3 a clarification that -- there's been a number of
4 intervenors that have said that recent research on
5 -- recent low-dose research is pointing to
6 mechanisms to explain the radiation risk.

7 And what I would like to say is
8 that the CNSC is following very seriously that
9 research. But when the research scientists talk
10 about low dose, they're talking about doses in the
11 range of 100 to 500 millisieverts.

12 So for research scientists that's
13 radiobiologists, that's called low-dose research
14 because laboratory experiments done at doses below
15 that, it's very hard to detect any changes from the
16 control experiment.

17 CHAIRPERSON GRAHAM: Thank you for
18 those comments.

19 DR. THOMPSON: My apologies, Mr.
20 Howden would like to --

21 CHAIRPERSON GRAHAM: Oh, I'm -- I
22 apologize. I didn't realize.

23 Mr. Howden?

24 MR. HOWDEN: Thank you. The --
25 the intervenor read from an article here and I'd

1 just like to correct a couple of the facts that are
2 in the article.

3 One talks about the 7,000 litres a
4 day leak from the NRU reactor. I just want to make
5 it clear that the NRU reactor has a liquid
6 confinement system and all the leaks that occurred
7 during this time were collected within the sump
8 system and then they would have been treated by the
9 waste treatment facility before any releases went.
10 So there's no direct path from NRU to the Ottawa
11 River. It's collected and then treated.

12 The other comment is on the 2007
13 shutdown of NRU where it says, "*The reactor was*
14 *restarted before any upgrades were done.*"

15 In reality, one of the seismically
16 qualified DC pump motor starters were connected
17 before Christmas that year before the reactor was
18 returned to service and the second was installed in
19 February, 2008. So the reactor did come up with
20 one -- half of the work done prior to the restart.

21 Thank you.

22 CHAIRPERSON GRAHAM: Thank you.

23 For clarification, would you just
24 explain by treatment, the 7,000 litres treatments,
25 how the tritium is removed or how it was treated

1 just for the benefit of the committee?

2 MR. HOWDEN: Barclay Howden
3 speaking.

4 From a treatment perspective,
5 tritium is difficult to remove from the liquid
6 system, but what the liquid -- the waste treatment
7 system is a reverse osmosis system and it mainly
8 removes any particulate or any sort of -- anything
9 that could be considered a fission product type
10 thing.

11 In terms of the tritium, any
12 tritium would have been collected, but I don't know
13 what the concentrations of tritium in this water
14 were. But the -- the reverse osmosis does not
15 remove the tritium.

16 CHAIRPERSON GRAHAM: But was the
17 tritium collected and not released into the Ottawa
18 River?

19 MR. HOWDEN: Barclay Howden
20 speaking.

21 Some of the tritium would have
22 been. Some of it would have been retained in
23 holding tanks to allow a decay period, but there
24 would have been some tritium released from that.

25 CHAIRPERSON GRAHAM: Without

1 getting into a lot of detail, would you know what
2 the percentage -- would the majority of it be able
3 to be collected in those tanks and put in those
4 tanks or would it be -- just roughly how much
5 tritium did get to the Ottawa River? I think
6 that's what the intervenor was questioning and just
7 for clarification.

8 MR. HOWDEN: I can't give you a
9 very accurate number, but the waste treatment
10 facility has very large holding tanks and I'd have
11 to go back -- it would be in -- I would be
12 guessing, but -- from the accuracy -- but it would
13 have been a percentage of what had been released
14 from NRU and collected, but I can't give you an
15 exact number, I'm sorry.

16 CHAIRPERSON GRAHAM: Thank you.

17 I've asked OPG -- any government
18 departments? I see none.

19 Questions from the floor; do we
20 have any? No.

21 Well, then, thank you very much
22 for your intervention this morning. Thank you for
23 coming and being sincerely expressing your views
24 and we did have your intervention before and had
25 read it, but it -- by putting it into the record

1 like you have, it gives the panel an opportunity to
2 ask some questions and we thank you very much for
3 coming and safe -- I know you're -- you don't have
4 far to go to go back to Whitby, but have safe
5 travels. Thank you very much for coming.

6 MS. JACKLIN: Okay. I just wanted
7 to make one --

8 CHAIRPERSON GRAHAM: Yes, go
9 ahead.

10 MS. JACKLIN: -- one final
11 comment.

12 The standards for tritium as they
13 stand now are for a healthy male. So what they can
14 withstand is very much more than a developing
15 foetus or a small child, if they're taking in the
16 same amount.

17 It has -- you know, it sort of
18 multiplies the effect of the tritium on them and on
19 their bodies and so on. And so as a grandparent
20 and so on, I'm very concerned about the effect of
21 our upcoming generation as well as those of us that
22 are here now.

23 Thank you.

24 CHAIRPERSON GRAHAM: Thank you.

25 We are also always interested to see how soon this

1 will be resolved from the 7,000 down to what is
2 being recommended and what is being peer-reviewed
3 and so on. We're always looking forward to seeing
4 the final recommendation.

5 MS. JACKLIN: Right. It's -- it's
6 quite a shocking number compared to the other
7 countries. Thank you.

8 CHAIRPERSON GRAHAM: Thank you
9 very -- but there is hope I think at the end.

10 MS. JACKLIN: Definitely.

11 CHAIRPERSON GRAHAM: Thank you
12 very much.

13 MS. JACKLIN: Thank you.

14 CHAIRPERSON GRAHAM: Oh, I'm
15 sorry, I wasn't paying attention. Dr. Lane -- I
16 was looking at the intervenor, do you have a
17 question.

18 DR. THOMPSON: I'm sorry, it's
19 actually --

20 CHAIRPERSON GRAHAM: -- or Dr.
21 Thompson.

22 DR. THOMPSON: -- Patsy Thompson.

23 I wanted to reassure the
24 intervenor that the risk factors that we use are
25 not for a healthy white male.

1 Essentially the risk factors are
2 based on humans of both sexes and all ages and
3 that's how the risk factor is identified, from
4 studies done on a foetus, infants, adults and
5 teenagers, people of all ages and both sexes
6 essentially.

7 When people talk about the risk
8 from a healthy white male it refers to what the
9 ICRP used to do when -- the risks are identified
10 based on a population that has been exposed to
11 radiation, but the dose used to be calculated for
12 an adult white male essentially because a lot of
13 the calculations were for workers, and at the time
14 most of the workers were white males.

15 But when public exposure started
16 to be calculated, the risk models -- the dose
17 models are for people of all age groups and both
18 men and women.

19 CHAIRPERSON GRAHAM: Thank you
20 very much. And with that, thank you very much for
21 your intervention, Ms. Jacklin.

22 The next intervenor, and the last
23 one of the morning, is Mr. Hamish Wilson.

24 Mr. Wilson, the floor is yours,
25 please come up and make your intervention.

1 And I might say, that intervention
2 is PMD 11P1.225.

3 Do we have Mr. Wilson? I was -- I
4 thought someone up there. I'm sorry, I wasn't --
5 Mr. Wilson, welcome.

6 MR. WILSON: Good morning.

7 CHAIRPERSON GRAHAM: And the floor
8 is yours, sir. I thought someone else was coming.

9 Go ahead, sir.

10 --- PRESENTATION BY MR. WILSON

11 MR. WILSON: Not a problem. Good
12 morning all. Thank you for being here, and some
13 thanks to all the staff and other intervenors.

14 Some pause as well in that
15 thankfully nuclear power has been highlighted with
16 the multiple tragedies in Japan, and it seems quite
17 possible that the workers on the front lines of
18 trying to contain those hazards, some of them may
19 not make it through to continue their lives. It's
20 possible. So just a pause because it's hard, you
21 know.

22 Even though as I think Mr. Pereira
23 was pointing out, there are risks with all sorts of
24 other things that we have, but the inherent
25 toxicity and nastiness associated with

1 radioactivity from the nuclear power plants I think
2 is really troublesome.

3 And, Mr. Graham, I would like to
4 thank you very much for twigging to the concept
5 that just because tritiated water goes into a
6 treatment plant doesn't mean to say that the
7 tritium is actually removed.

8 I was a little cross with the
9 gentleman who brought that point up without
10 actually fully explaining that, you know, or
11 knowing what the percentage of, you know, removal
12 actually was.

13 So I really think that you were
14 very sharp in questioning that because that's a
15 very important thing. If there is a release, how
16 much actually gets taken out or is it just passed
17 through?

18 So I hope over the course of the
19 hearings you will actually be able to define that
20 percentage of treatment a little bit more
21 accurately. Thank you.

22 So some concerns about these
23 environmental assessments and how relatively
24 limited in scope and content they may be, though
25 that might reflect my ignorance. But there's a

1 definite perception that some facts don't or won't
2 matter, decisions seem to be perhaps already made,
3 i.e. build it, though others may not be, e.g. what
4 exact type.

5 And the overall feel of the
6 politics here is that it can be less useful perhaps
7 to be here, although many of us are just because
8 it's a forum. Thank you very much.

9 And unfortunately we have seen,
10 just in the last couple of days in Toronto, one
11 example of the politics kind of running over
12 planning, with the provincial government abandoning
13 sensible transit plans to curry favour with some
14 voters ahead of a provincial election.

15 So despite all your concerns,
16 despite everybody's presence here, the politics can
17 actually interfere, if not supersede, what your
18 recommendations might be,

19 So given the multibillions
20 involved here and the past multibillions and
21 overruns with nuclear plants and facilities here,
22 and it is so frequent -- these overruns are so
23 frequent it may almost be considered a tradition,
24 and then to really consider the scale of things and
25 the length of the radioactivity of the materials

1 and their volume and how hostile to life it all is,
2 it makes me think of something called intervenor
3 funding.

4 Once upon a time enviro groups and
5 public interest groups didn't have to have bake
6 sales, nor have their individual assets quite so,
7 you know, at risk perhaps.

8 It would be very helpful if
9 somehow these processes took not 1 percent maybe,
10 but .01 or even less of the total actual cost of
11 the proposals, and actually shared it with people
12 to make really informed presentations. And not
13 just to you, but to the credit agencies that may
14 actually have more power.

15 So our EAs do tend to be feeble
16 and full of shortcomings, and I have more
17 experience with the Ontario versions than the
18 federal examples.

19 Just a couple of years back,
20 further west of here on Bloor Street, we had the
21 city put a major streetscaping project on Bloor
22 into a rubber stamp A plus category when the
23 dividing line between the class A plus and the
24 class B was 2.2 million and the project itself was
25 25 million. So we can see some errors in the

1 applications of EAs.

2 And it's also nice to think that
3 we actually have a fulsome examination of the
4 options to the project.

5 Now, maybe that is not possible,
6 maybe we have the -- the only thing that we can
7 look at here is the elephant with its radioactive
8 poop.

9 Highly hot stuff, versus, say, a
10 bicycle, even though bicycles are not always benign
11 and sometimes can be risky, depending on who
12 operates them, but we really do have to make sure
13 that we really truly consider the options,
14 especially given all the costs involved, which are
15 very substantial.

16 I think we need a very rigorous
17 examination of the energy requirements of a project
18 in both the capital energy, as it were, the
19 embodied energy that -- and all the materials that
20 go into the plant, the whole fuel cycle and the
21 operating energies, and how will the project result
22 in a decrease in both types of energy? This needs
23 thinking along the lines of energy in and energy
24 out. Energy investment and what we get back.

25 And looking at the embodied energy

1 of a project and the overall carbon dioxide and the
2 greenhouse gas emissions of a project from all
3 aspects, and of course it would be instructive to
4 have all types of energy projects seen through the
5 same lens, it's true.

6 So for a true environmental
7 assessment we really would have a full, thorough
8 look at all the energy, tabulating up the carbon
9 dioxide and other, the greenhouse gasses associated
10 with a project.

11 And with a nuclear plant, this
12 means looking at all of the various aspects of it,
13 and of the nuclear fuel cycle, and of the energy
14 costs of the maintenance and disposal of the rad
15 waste.

16 So an assessment would mean
17 looking at the energy involved in the mining and
18 the refining of the uranium, and that should also
19 include the energy that's required for any cleaning
20 up the tailing ponds, or at least their safe
21 containment until the radiation is back to a more
22 safe, normal, healthy to life level.

23 And that does -- you know, I don't
24 think we do terribly well at actually managing the
25 radioactive waste, and yet it is sort of a burden

1 upon future generations, and the energy, the cheap
2 energy, may not actually be around anymore.

3 It also means a thorough
4 environmental assessment of the plant and the
5 project. It means looking at all the various
6 components of a nuclear plant, like the metal,
7 tabulating up all the metal that's used in the
8 various pipes, and if there's aluminum.

9 And if there's aluminum there has
10 been a very nasty, pretty much permanent greenhouse
11 gas associated with the smelting of aluminum.

12 I'm a little bit rusty on how it
13 sorts itself out, if cleaner smelting processes
14 have eliminated these pretty much permanent
15 greenhouse gasses, but they are, like, 30,000 times
16 -- this is old memory, but it's maybe 30,000 times
17 more potent greenhouse gas than a carbon dioxide
18 molecule, and they are very long -- long lived. So
19 you have to look at that aspect of things, how much
20 aluminum is actually put into these plants.

21 And if we have components that are
22 brought in from other parts of the world, let's
23 tabulate up all those greenhouse gasses. Currently
24 we don't really actually manage to include the
25 shipping of materials hither and yon.

1 And we should probably actually
2 look at how much of our power grid is nuclear
3 related, and we should have that contrasted with
4 the distributed load help of renewables that are
5 much more on-site and you don't have to have the
6 power grid structure, nor as heavy a copper --
7 copper line bringing the power in if you actually
8 have your on-site generation.

9 So I'm not saying that the --
10 there aren't implications to materials consumption
11 from all the -- the desirable conservation projects
12 and renewables projects on individual houses, but
13 my sense is that the centralized massive sort of
14 scale of project that we are contemplating here has
15 a heck of a lot more impact, quite honestly, than
16 -- than the -- the conservation renewables path.

17 A thorough environmental
18 assessment, I feel, means looking at how far the
19 work crews building it drive in to their daily
20 work. My sense is that they won't be bicycling.

21 You know, a good sense of how many
22 tonnes of concrete and cement are being actually
23 put into these buildings is also helpful.

24 And bear in mind, please, that
25 extra carbon dioxide is associated with the

1 production of cement. So it isn't merely the --
2 the energy involved in digging up some parts of the
3 Niagara Escarpment and bringing it into, you know,
4 the -- the cement kilns, but when you actually
5 produce cement, there's -- you're burning limestone
6 basically.

7 So it's very energy intensive and
8 you're driving off carbon dioxide. So it's not
9 just a mere energy calculation that you have to
10 bear in mind when you're assessing full
11 environmental impact, but add some more, please.

12 And you also have to do a thorough
13 environmental assessment here. You also have to
14 take a very realistic view of how much energy is
15 going to be required to collect and dispose of the
16 rad waste and monitor it for however many tens of
17 centuries it will actually be -- be around for and
18 then what happens if it actually leaks somewhere.

19 And we may have a relatively good
20 system of nuclear power plants here, relatively
21 speaking, of relatively good design and relative
22 geological stability, but the Achilles heel of it
23 all, as I think you probably know, or one of the
24 major concerns is just the incredible toxicity and
25 radioactivity over the centuries that the -- the

1 rad waste will be around for.

2 And I think to actually think
3 about things again, it also means looking at how
4 much energy is required to remove the Tritium
5 release from our nuc plants into water and, you
6 know, if it's not done, well, you know, that --
7 that's something else. If it can't be done, then
8 maybe it shouldn't be done.

9 We also need to look at the
10 various operating energies, so, again, there's a
11 difference between the capital energy investment in
12 the plant and the operating energy investment in
13 the plant such as how long a set of trips did the
14 various workers actually take to come in to their
15 jobs.

16 While I'd like to respect the
17 privacy of the staff, we really should also try and
18 find out how many kilometres they actually log in
19 in their daily commute.

20 And I suspect that most current
21 staff and management at Darlington and Pickering
22 don't walk in or bike to their workplace, but many
23 of them probably drive in.

24 And it'd be very, very interesting
25 to find out just, you know, okay, by postal code,

1 where these people actually live and how many of
2 them are upwind.

3 You know, what's the proximity of
4 the people that are actually closest to the plant,
5 doing their work, getting their livelihood from it?
6 Do they live next door to it or do they live 10, 20
7 kilometres away?

8 That might be a very good
9 indicator of just how safe the workers and the
10 management actually feel these plants are. And, of
11 course, to be fair, we absolutely need to ensure
12 equal application of these criteria to other forms
13 of energy, but the renewables side of things will
14 likely be performing far, far better.

15 Conservation too needs scrutiny as
16 I've seen weather-stripping here made in China and
17 I do wonder if the energy embodied in the plastic
18 of a tube of caulking is far, far greater than the
19 energy it might save.

20 And despite the billions spent or
21 propose to be spent or the myriads of experts here
22 of various official bureaucracies, et cetera, et
23 cetera, I think we will tend to find the answers
24 and the information from abroad much more than we
25 will around here. So I would urge you to look to

1 Europe and look to California.

2 One example is from Stanford and
3 University of California, two profs there, Jacobson
4 and Delucchi, have published and -- and examined a
5 particular -- what do they call it? This is from
6 Photon magazine, from -- what is the -- issue 11.
7 I think it's November or so from 2010.

8 The -- the Stanford University
9 professor, Mark Jacobson, and University of
10 California Davis professor, Mark Delucchi,
11 published in November 2009, Scientific American
12 magazine, a proposal to actually convert everything
13 to renewables and -- and a cleaner energy
14 situation. Of interest -- this is a side bar in
15 this -- this article and I will quote from it here,
16 their plan:

17 "Ruled out nuclear power
18 because nuclear releases up
19 to 25 times more carbon
20 emissions than wind energy
21 when a reactor is built and
22 when uranium is refined and
23 transported."

24 So that's kind of significant.
25 That was on page 30.

1 Twenty-five times more, that's a
2 lot. It may not be true or completely true. I
3 would -- I -- I'm a little bit rusty on all of
4 this, so don't take my word for it just because I'm
5 -- I'm reading out from a magazine, but I would
6 suggest that this is a very, very important aspect
7 of -- of things to really, really, really look at
8 how we are actually going to be balancing out our
9 -- our assessment of the overall impacts.

10 And -- and presumably the
11 components of wind power, for instance, can be
12 readily re-used and recycled at the ends of their
13 lifetimes, but we have some issues with the old
14 nuclear equipment, don't we, going well beyond to
15 moving it over to Sweden, which is a long ways over
16 from this area here.

17 I would also urge you to have a
18 full, complete assessment of the cradle to grave
19 risks to health and life from the nuclear fuel
20 cycle. And this has to be included in it and I'm
21 very pleased to hear people are really being
22 concerned about this.

23 And you should try and compare it
24 with the alternatives. Sure, too much sunshine can
25 give us cancer, but the plenitude of the sun and

1 its relative distribution does make it all better.

2 I would be -- I wish to again
3 reinforce the issue of the Tritium. It's -- it
4 seems to be an inherent problem of our nuclear
5 reactors and it's very, very difficult to get it
6 removed, so that's -- that's another Achilles heel.

7 And again, the Canadian reactors
8 are less prone to trouble than other types, but we
9 still have the -- the whole issue of the -- the
10 fuel chain.

11 We also may be far more secure --
12 or, no, pardon me, retract that.

13 We also may well be less secure
14 with earthquakes than is thought. I hope other
15 people have managed to bring this up and I bet you
16 they have, but I have seen a visible fault line in
17 the exposed rock on the west bank of the Rouge
18 River and recently have seen some maps showing
19 earthquakes in Southern Ontario and under Lake
20 Ontario and things are not quite as stable as
21 perhaps we might think.

22 So -- let's see -- yes. That's
23 another big concern. Maybe not as big as in Japan,
24 absolutely, and it may be relatively minor compared
25 with the -- the fuel cycles and relatively minor,

1 say, compared with -- you know, dare I say, a
2 terrorist attack on nuclear plants is perhaps
3 another concern.

4 I think you should also be
5 concerned about the environmental blight from
6 excess spending on -- on nuclear power. You
7 absolutely must compare -- it's \$35 billion. That
8 can buy an awful lot of solar panels or wind
9 generators.

10 You know, how many panels -- how
11 many solar panels, how many windmills, how many
12 turbines, how many bike-powered generators for flat
13 screen TVs could we actually buy with that 35
14 billion and install? Will the cutting butter with
15 the chainsaw wipe out any chance of the negawatts?
16 We have a set of opportunity costs.

17 So you have to look at, as well, I
18 think, how expensive the nuclear fuel will become
19 when we run out of the easy stuff perhaps way, way
20 sooner than most of the proponents will admit to.
21 So by the time some of these plants may actually
22 get built, what's the price of uranium going to be?
23 Is it going to be double what it is now?

24 We likely have peak uranium, along
25 with peak oil, peak natural gas, peak atmosphere,

1 not that we can expect some extremely rare concepts
2 like, pardon me, energy policy to percolate through
3 to the partiers and the politicians sometimes.

4 Energy policy here seems left --
5 best left to foreigners as we sell off our assets.
6 I'm afraid I'm a bit cynical about the wisdom of
7 our political processes to actually lead us towards
8 sustainability.

9 And the costs of the rad waste
10 monitoring and disposal isn't solved -- it's a
11 long-term problem, a set of long-term costs. So I
12 think any spending on nuclear power will blight
13 conserving and greener options.

14 If there is only so much money,
15 and deficits and cracks are appearing here there
16 and everywhere and if we get into a period of high
17 interest rates and high energy costs, as well, to
18 build more energy things, including rebuilding
19 energy consumption through badly needed retrofits,
20 the nuclear blight will restrain us to the point
21 that maybe we won't be appropriately able to invest
22 in the conservation and renewable options.

23 You know, there is only so much
24 money going around it seems. We're having deficits
25 at point the provincial and federal level and

1 municipal level, so to blow the bundle on something
2 that's -- you know, may as well be gold plated and
3 probably should be as Mr. Chai has pointed out.

4 We've had a couple of decades of
5 knowing that the conservation and renewables
6 options are the better way of going. I dug up an
7 old copy from the tail end of the '70s, something
8 called *Energy Future*.

9 It was commissioned Mr. --
10 President Carter to look at the -- what the best
11 way of the U.S. of A proceeding with their energy
12 policy was and they basically said conservation and
13 renewables, that's the way to go.

14 The Conserver Solution, I don't
15 always agree with Mr. Lawrence Solomon now, but
16 whenever this was, this was '78, '79. I'll see if
17 I can find something here. Yeah, from page 21, a
18 sidebar here. "Nuclear energy is the cheapest form
19 or energy from the Conserver Solution."

20 To quote from it, "Nuclear energy
21 never looks cheap even by government accounts, but
22 its costs can look reasonable if we don't consider
23 everything involved.

24 For example, the cost of the
25 transmission lines needed to get the electricity

1 from the power plant to the home is often
2 forgotten.

3 When all the costs are counted,
4 nuclear energy becomes nobody's bargain, ending up
5 twice as expensive as regular electricity and 20
6 times as expensive as saving an equal amount of
7 energy through conservation."

8 So my sense is that this -- these
9 viewpoints of conservation and renewables being
10 eminently sensible. It's at least 30 years old and
11 yet we've got this incredible proposal even though,
12 yes, we need some base power, et cetera, but even
13 though, you know, we're in 2010.

14 And updates here, more recently
15 we've had a slew of reports from groups like
16 Pembina, Greenpeace and the Suzuki Foundation that
17 have laid out how we can proceed here in Ontario to
18 a far less energy intensive future and less carbon
19 and environmental damage without relying on
20 nuclear.

21 And I believe these people are
22 probably presenting or have presented or have
23 attempted to influence you. And I thank you and I
24 would urge you to actually really consider their
25 presentations.

1 And we have been making progress
2 in that area, but not enough. So it's -- it's not
3 necessarily a question of technologies, but their
4 application and it can be a set of issues of humans
5 versus technological availability.

6 We not only know what needs to be
7 done. We have often a great deal of technology
8 available, so even just in this last week, there
9 was a bit of information arriving that we may have
10 gotten to the point in our research that we have
11 the equivalent of a "solar photovoltaic leaf,"
12 quote, unquote.

13 Not that our centralized power
14 systems want to have that sort of distributed
15 availability because we have, you know, the 20
16 billion dollars of stranded debt that we want to
17 get paid off. And we can't take it out from the
18 pensions.

19 The IMTs, William Nosara (ph) has
20 been working on that and that I think would be a
21 far better investment than these nuclear power
22 plants. So again I trust that the various groups
23 that you have been listening too and heeding, thank
24 you, will -- the conservation enviro groups will
25 have provided a lot more material than I am here.

1 I would like to try to flag a
2 gross inequity though, a specific thing that may
3 well occur with trying to move us towards a greater
4 sustainability. And we do have a marked propensity
5 towards sacrificing equity for votes, especially
6 suburban votes and suburban, what I would call,
7 "voterists".

8 Along with the excess of carbon in
9 the atmosphere, we also have an excess of car
10 driving. And it's a lot easier to be a gashouse
11 green leaving in downtown Toronto than it is to be
12 out in this area where your destinations are, you
13 know, very much spread out.

14 But given how tied up car driving
15 is linked to freedom and the good life, a few
16 politicians are going to look at the mess that
17 we're in and make a point of suggesting that we
18 drive too much or that the driving is dragging us
19 down or that we really should start paying far
20 more, even European prices.

21 Though I must admit I was very
22 pleased to see on MSN site yesterday that there was
23 going to be a 30 cent litre boost in gas overnight.
24 Now, it was sort of an April Fools' joke, but I
25 think maybe it just went up five cents a litre

1 maybe. It's a start for some of us.

2 So to get votes and be green, we
3 are seeing a push to electric cars to keep -- help
4 keep the voting public more content and give the
5 illusion of more sustainability and being green,
6 but I think we'll have a real clash of the reality
7 of how excessive our built form and driving
8 actually is. And how inadequate the electric
9 vehicles are likely going to be for the hyper
10 mobility that we have now felt as of right.

11 But just as suburban built form is
12 subsidized to some extent, perhaps a large extent
13 by compact and inherently green dense cities, we
14 may see a situation where drivers get a big subsidy
15 for their plug-in electric vehicles from the
16 Ontario government.

17 The energy intensity of a
18 recharging station and to -- you know, the energy
19 intensity of trying to keep up that degree of hyper
20 mobility and what it will likely take to keep the
21 highways clogged, it may well soak up a huge amount
22 of electricity and capacity and output.

23 And I believe there might have
24 been a light on, you know, somebody within Toronto
25 Hydro might have went, oh, yeah, we're going to

1 have a problem with that. Maybe five months back I
2 think, I can't remember and I didn't manage to dig
3 it out from my pile of paper, et cetera.

4 But our roads are amazingly like a
5 free grid, where people can plug in their toasters
6 and heat sources and mobile furnaces with far less
7 direct cost than what we pay for when we use
8 electricity, so again given what is just happened
9 with Mr. McGinnis avoiding, if not abandoning
10 equity within the Toronto Transit problems. We
11 need to be clearly outlining just how much possible
12 demand there may be arising from electric vehicles.

13 And more importantly to get the
14 drivers to pay directly and proportionately for
15 what they might be using or could use, so to some
16 extent, we have a lot of what I would call, corrupt
17 politics here in Ontario.

18 And I would actually, you know
19 really stress that we have to be very careful about
20 how we manage to -- the intersection of electric
21 power provision and trying to accommodate hyper
22 mobility that we've been accustomed to.

23 No, get the car drivers to pay the
24 full freight of -- of any possible -- you know, the
25 charger that may -- they may be required,

1 especially when it may be really expensive and
2 dangerous, inherently dangerous nuclear.

3 So you've obviously heard that
4 there is a certain amount of -- if not strong
5 concern to the blighting affects of the major
6 nuclear power plants.

7 I would certainly urge that we
8 focus on conservation and renewables as far more
9 effective, safer, greener, moral, equitable, and
10 cheaper and putting it all into more centralized
11 and inherently dangerous -- even though they're
12 relatively good, inherently dangerous nuclear
13 plants. Thank you.

14 CHAIRPERSON GRAHAM: Thank you
15 very much, Mr. Wilson.

16 We will now go to a question from
17 the -- from the Panel and Madam Beaudet.

18 --- QUESTIONS BY THE PANEL:

19 MEMBER BEAUDET: Thank you, Mr.
20 Chairman.

21 I would just like to bring to the
22 attention of the intervenor that for windmill
23 turbines, some provinces in Canada have had to
24 establish a system of financial guarantee to ensure
25 that they are dismantled at the end of their life

1 and properly taken care of and disposed of.

2 I think it's Saskatchewan who has
3 a windmill farm that is still standing there and
4 rusting away.

5 We did -- the panel did have some
6 presentations on seismic risks the second day of
7 hearing.

8 I would like to go to OPG because
9 I believe you are the second person mentioning
10 about the River Rouge Valley and I believe that the
11 assessment was done when you built Pickering or
12 when you built the existing Darlington site and was
13 just to be of low risk.

14 MS. SWAMI: Laurie Swami.

15 The intervenor referred to a
16 visible, potentially a visible seismic area in the
17 Rouge Valley.

18 That was raised to OPG's attention
19 during a review of the Pickering site in the late
20 '90s, when we did an environmental review project.
21 At that time, we considered that and looked at it
22 very closely.

23 We did, in fact, engage external
24 experts to look at that and it was confirmed that
25 it was a glacial deposit and not as a result of

1 seismic activity.

2 So that information was done
3 independent from OPG; was submitted to the
4 regulator, the ACB at the time, to review and
5 ensure that that was the correct interpretation.

6 So that, in fact, has been
7 included in a lot of the work we've done now, but
8 it also was reflected back in the late '90s that it
9 was confirmed not to be an active area.

10 MEMBER BEAUDET: Thank you.

11 And for the information of the
12 public, you can find reference to this study in the
13 licence to prepare a site document, the additional
14 information. It's on the registry. Thank you.

15 Thank you, Mr. Chairman.

16 CHAIRPERSON GRAHAM: Thank you,
17 Madam Beaudet.

18 Mr. Pereira?

19 MEMBER PEREIRA: Thank you. Thank
20 you, Mr. Chairman.

21 I just wanted to get some
22 clarification on your -- the concepts you're
23 talking about with respect to distributed
24 generation because many intervenors have come
25 forward with that concept.

1 So this would be a proposal to
2 have windmills and solar, backed up by gas; would
3 it be or what -- how would --

4 MR. WILSON: Well, I think there's
5 an awful lot that we could be doing. I'm not up on
6 all of the technology because it seems to be
7 expanding so incredibly quickly, but I believe that
8 there's battery storage; there are other means of
9 actually storing energy chemical batteries, not
10 just the deep cell batteries.

11 There's always an issue if you're
12 trying to go for more self-reliance and energy
13 independence, of having a continuous flow when you
14 need it. So yes, there's always going to be some
15 concern.

16 But if you are in a more remote
17 location, for instance, the -- one of the tip-offs
18 -- tipping points for people to go for a PV
19 actually and energy independence is the cost of the
20 transmission line from the road to the more remote
21 location.

22 So clearly the cost reflects the
23 energy intensity of -- and the human cost as well
24 of bringing those power lines in.

25 So of course, everything has an

1 energy cost that we do and some impacts, but my
2 sense is that having the generating distributed to
3 match the loading will inherently be more reliant,
4 flexible and people can manage -- I'm sure, the
5 technology is around, they can manage to build in
6 their backups and their ability to keep things
7 going.

8 MEMBER PEREIRA: Thank you,
9 because many of the proposals have come forward
10 with gas and combined with power being part of the
11 network of independent distributor to generation.

12 So that remains a challenge of how
13 to assure continuous supply. But it's a good
14 concept and we have heard it proposed by many
15 intervenors.

16 Thank you, Mr. Chairman.

17 CHAIRPERSON GRAHAM: Thank you,
18 Mr. Pereira.

19 I have just one question to the
20 intervenor. You talked about emissions at 25 times
21 versus wind. That, I believe -- does that include
22 from the mining to the processing of uranium to the
23 generation to the decommissioning? Is that what
24 you're referring to?

25 MR. WILSON: I'm not entirely sure

1 of that, sir. It seems to be within the work of
2 Mark Jacobson and Mark Delucchi. They seem to have
3 the details.

4 I didn't have the time to fully go
5 into it, but I have the sense that it's starting to
6 be a very big item with some people is to fully
7 explore all of the -- all of these impacts and the
8 full impacts of the cycle -- the complete package.

9 CHAIRPERSON GRAHAM: Thank you
10 very much.

11 The floor will now go to -- the
12 panel will now go to OPG; do you have any questions
13 or discussions?

14 MR. SWEETNAM: Albert Sweetnam,
15 for the record.

16 Just a quick comment to add to
17 what Madam Swami just said in response to Madam
18 Beaudet.

19 It should also be noted for the
20 record that when the issue around Rouge Valley
21 fault -- supposed fault was raised and the study
22 was done in the '90s, this was not a desktop study.
23 This was actually a study that involved full-site
24 investigations and it's fully detailed in our
25 previous submission.

1 Thank you.

2 CHAIRPERSON GRAHAM: Thank you
3 very much.

4 CNSC?

5 DR. THOMPSON: Patsy Thompson.

6 No questions, but I would like to
7 -- the intervenor made a comment earlier in his
8 presentation about the lack of funding for
9 participation.

10 And I just wanted to clarify that
11 participant funding was available and it was
12 administered by the Canadian Environmental
13 Assessment Agency and I believe Mr. Yves Leboeuf,
14 when -- the first day of the hearing on March 22nd,
15 talked to the participant funding program.

16 CHAIRPERSON GRAHAM: Thank you. I
17 had made a note on that also.

18 MR. WILSON: I am pleased to know
19 that I am wrong.

20 CHAIRPERSON GRAHAM: Not a
21 problem. It's not the first time any of us are.

22 Government participants? I don't
23 see any.

24 Well, Mr. Kalevar? And I would
25 advise you, sir, that the question on gold will not

1 be entertained.

2 --- QUESTIONS BY THE PUBLIC:

3 MR. KALEVAR: No, gold has been
4 already supported by the presenter; so I don't have
5 to touch it.

6 It's about funding. I just wanted
7 to bring to your attention that as Ontario
8 Coalition for Energy Planning before professor --
9 in the '78 submission of Professor Porter, we did
10 have -- I mean, funding for the whole coalition.
11 I'm pleased to know that some funding is available.

12 I would like to know if my car
13 rental coming from Toronto to here can be covered
14 by that?

15 CHAIRPERSON GRAHAM: No. There's
16 an application. The application is reviewed. The
17 application is to get expert advice and witnesses
18 and to help prepare interventions. It doesn't
19 cover coming to this hearing.

20 And I think you were aware of
21 that, sir, so I would suggest you look at the
22 guidelines for funding and that would give you that
23 information.

24 Mr. Wilson, thank you very much
25 for coming today. Thank you for your presentation

1 and we certainly hope that you have a safe trip
2 back and we appreciate your concerns and your
3 message. Thank you very much.

4 MR. WILSON: Merci beaucoup. And
5 the biking along Bloor here, it was interesting
6 because there's about a two-inch gap between the
7 side of the road and I work for bike lanes in
8 Toronto and it's interesting coming out here.

9 So merci beaucoup and I am very
10 pleased to hear that you're getting good value, the
11 money that's getting invested in the intervenors.
12 I think it's excellent value.

13 Merci beaucoup.

14 CHAIRPERSON GRAHAM: Thank you.
15 And with that I declare it twelve o'clock and the
16 chair will resume at 1:30.

17 ---Upon recessing at 11:55 a.m. /

18 L'audience est suspendue à 11h55

19 ---Upon resuming at 1:30 p.m. /

20 L'audience est reprise à 13h30

21 MS. McGEE: Good afternoon. My
22 name is Kelly McGee.

23 Welcome back to today's second
24 session of the public hearing of the Joint Review
25 Panel for the Darlington New Nuclear Power Plant

1 Project.

2 Secretariat staff are available at
3 the back of the room. Please speak with Julie
4 Bouchard if you are scheduled to make a
5 presentation, if you'd like leave of the Chair to
6 ask a question, or if you're not registered and
7 would now like to make a brief statement.

8 Opportunities for questions or to
9 make brief statements will be subject to the
10 availability of time.

11 Please identify yourself each time
12 you speak so that our transcripts can be as
13 accurate as possible.

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

17 Thank you very much.

18 CHAIRPERSON GRAHAM: Thank you
19 very much, and good afternoon, ladies and
20 gentlemen, and those that are joining us on the
21 various methods of electronic information highway.

22 he first intervenor this afternoon
23 is Gail Cockburn, and that can be found in PMD 11-
24 P1.136.

25 Ms. Cockburn, welcome, the floor

1 is yours.

2 --- PRESENTATION BY MS. COCKBURN:

3 MS. COCKBURN: Thank you. Good
4 afternoon, Chair Graham, panel members, ladies and
5 gentlemen. I'm here today to speak to you about
6 the proposed new generating capacity at the
7 Darlington site at the cost of \$33 billion.

8 As a way of introduction my name
9 is Gail Cockburn. I am a resident at Whitby and
10 have lived in the Oshawa/Whitby area since 1961
11 when I came to the area as a young woman to enter
12 nurse's training at the Oshawa General Hospital
13 School of Nursing where I graduated in 1964.

14 I was unaware of nuclear power or
15 that a nuclear generating facility was being built
16 at Pickering and coming on line in 1971.

17 I had read Rachel Carson's 1962
18 book, *Silent Spring* where she raised the issue
19 about pollution in our environment. Her book,
20 *Silent Spring*, talked about the effect of DDT and
21 other chemicals in our environment.

22 She also, at the time, made the
23 connection between chemicals and radiation, and the
24 intensification of the effects of radiation in
25 conjunction with chemical pollution.

1 Gradually I learned more about
2 nuclear power and all the issues as I was raising
3 our young family. I've been concerned about the
4 health effects of the emissions from nuclear power
5 plants.

6 I am also concerned about the
7 safety of these facilities, and so I'm here today
8 to raise these concerns.

9 I want to raise my objections to
10 this proposal for new generating capacity at the
11 Darlington site. I'm concerned not only about the
12 cost, which as taxpayers we would incur, but also
13 for the fact that there are alternatives now.

14 There are many less costly, clean
15 and green energy sources that would be suitable for
16 the generation of power for Ontario residents.

17 I am concerned not only about the
18 cost, and that there are alternatives to nuclear
19 power, but I'm also concerned about the ongoing
20 health effects as residents of this community that
21 we are expected to endure.

22 The government is proposing a new
23 \$33 billion nuclear facility at the Darlington
24 site. We are still paying for the construction of
25 the generating capacity that we already have, a

1 debt of \$27 billion that we, as taxpayers, are
2 obligated to repay.

3 So it is time to place our tax
4 dollars in clean and green energy. It is time to
5 halt the detrimental health effects of nuclear
6 emissions from Pickering and Darlington on those of
7 us living in Durham Region who are enduring these
8 health effects and costs. And it is time to choose
9 safe, clean, green energy options.

10 We have a chance, a choice to say
11 yes to green energy and no to this proposal. With
12 the *Green Energy Act* there is an opportunity to
13 allow for green energy growth beyond the 8 percent
14 capacity now available on the power grid.

15 As Pickering B is retired
16 beginning in 2013, there will be 2,000 megawatts of
17 capacity on the power grid for green power. Green
18 power options on the grid are flexible, able to
19 accommodate the need for more or less power.

20 Nuclear power, on the other hand,
21 is not flexible. It cannot be easily or safely
22 adjusted to meet changing need. Let's be bold and
23 thoughtful about green power and make the right
24 choice for health and our pocketbook.

25 Recent studies in 2007 and 2008

1 have shown the connection between the incidents of
2 childhood leukemia and mortality and living within
3 15 kilometres of a nuclear facility.

4 Other studies of people living
5 near such facilities have shown a rise in the
6 incidents of leukemia, breast, lung, bladder and
7 thyroid cancer, and birth defects.

8 In his book, *The Enemy Within*, Jay
9 Gould demonstrates using statistics at the National
10 Cancer Institute that women living within 50 and
11 100 miles of a reactor site, have a higher breast
12 cancer mortality than those living further away.

13 I was astounded by the
14 geographical magnitude that low-level ionizing
15 radiation from the reactor had on the lives of
16 these women. In his book, Gould writes:

17 "Such continuous small
18 releases from nuclear
19 reactors can be more serious
20 than major single doses, such
21 as from the Chernobyl
22 accident. In 1972 it was
23 discovered that protracted
24 and continuous exposures at
25 low doses are more

1 commission was that after Darlington there was to
2 be no nuclear capacity build until waste disposal
3 was solved.

4 So here we are with a proposal
5 before the Joint Review Panel for their
6 consideration to increase the generating capacity
7 at Darlington.

8 Right now in Ontario there is
9 44,000 tonnes of high-level radioactive waste in
10 pools and dry storage near the reactors. In more
11 than 50 years of nuclear power generation, there
12 has not been a location found or a method devised
13 to safely dispose of this waste.

14 As the panel weighs my concerns
15 and the concerns of the other intervenors, I
16 encourage you to consider this an opportunity for
17 us in Ontario to pause; to take time to re-evaluate
18 nuclear power; to assess the ethical issues of the
19 waste and debt placed on succeeding generations; to
20 investigate renewable energy options for Ontario.

21 I request the panel to consider
22 this as you make your recommendations to the
23 government.

24 Thank you.

25 CHAIRPERSON GRAHAM: Thank you

1 very much for your presentation, and we'll open the
2 floor immediately to questions from panel members.
3 And I'll go first to Mr. Pereira.

4 --- QUESTIONS BY THE PANEL:

5 MEMBER PEREIRA: Thank you, Mr.
6 Chairman.

7 Thank you for your presentation.
8 We have had many intervenors talk to us about
9 health effects and health studies, and over all of
10 those interventions we've gone back to get an input
11 from CNSC staff on what they have done on health
12 studies, and they have a number of studies done in
13 Ontario in the region surrounding nuclear
14 facilities, and they've come back to us with advice
15 on risks.

16 Yesterday we placed some more
17 actions for them to look at -- data from around
18 Canada on the incidence of cancer.

19 And there seems to be two schools
20 of thought here; that there are -- no level of
21 radiation is acceptable and that any dose gives you
22 a risk of cancer, and there's other views that they
23 have expressed which says that up to a certain
24 level there's a tolerable level of risk.

25 We, as a panel, are looking at the

1 proposal to build new nuclear facilities. Our
2 mandate is to look at the environmental impact,
3 whether it's the impact on the environment and
4 health around the construction of a project.

5 Our mandate's not to decide on
6 whether you go with nuclear or renewables, that has
7 been decided upon by the Government of Ontario, and
8 there was a consultation process on -- leading up
9 to the government's decision on building new
10 nuclear.

11 So that is something slightly
12 beyond what we are being required to do. We were
13 provided with guidelines which were developed
14 through a consultative process and we work within
15 the frame of those guidelines.

16 So we are trying to assess whether
17 if a nuclear generating station was built adjacent
18 to the current one, two to four reactors, whether
19 there would be significant impacts on the
20 environment and on the health in the vicinity of
21 the station.

22 That's what we're looking at.
23 We're collecting a considerable amount of
24 information on different aspects -- all of the
25 aspects that you touched upon; the emissions and

1 likely impacts on health.

2 But going back to that
3 consultation early on, were you and your community
4 involved in consultations that the Government of
5 Ontario launched in support of the development of
6 that policy?

7 MS. COCKBURN: As a member of the
8 community, I never heard anything about the chance
9 to have input into guidelines that might be set for
10 the possible rebuild at Darlington.

11 I don't know who heard about it.
12 I've been attending the sessions here, you know,
13 fairly often and following them on the webcast, and
14 I know it has come up before where you've spoken to
15 people about the same concerns I have and I
16 certainly never heard about it and certainly did
17 not have any input.

18 MEMBER PEREIRA: Yes, so that did
19 happen. We had the Assistant Deputy Minister of
20 the Ministry of Energy of Ontario here on the
21 second day of our hearing and he gave a
22 presentation on the way on Ontario decided on the
23 energy mix and the basis for the decision to expand
24 nuclear, and he spoke about what consultation they
25 undertook, and so that's where we start from.

1 I'll just to -- because you've
2 raised so many questions about health, I'll just go
3 to CNSC staff to comment on where we stand on
4 assurance of health, like the health studies that
5 we've done -- been done, and what we find about the
6 effect of low levels of radiation dose on the
7 health of people in the vicinity of the reactor
8 stations.

9 CHAIRPERSON GRAHAM: Mr. Pereira,
10 also to staff, the CNSC representatives, this
11 morning you were going to give us some more
12 information on non-fatal cancer and so on. So
13 maybe you could combine that in the answer before
14 we go back to the intervenor?

15 DR. THOMPSON: Patsy Thompson, for
16 the record.

17 If I could, I could start with the
18 ICRP risk factors and consideration of non-fatal
19 cancers, and then perhaps I could try to provide
20 some information in relation to communities living
21 around nuclear facilities.

22 And so with respect to the ICRP
23 dose limits and what risk factors are considered,
24 the ICRP dose limits include consideration of
25 cancer because cancer is the limiting effect at the

1 levels of radiation exposures that are in the range
2 of the hundreds of millisieverts rather than
3 sievert range.

4 Cancer that is considered is both
5 fatal cancer and non-fatal cancer and that the risk
6 factor also includes consideration of hereditary
7 effects, even though no hereditary effects have
8 been seen in human populations.

9 Risk for health effects, such as
10 miscarriages, are not included in the risk factors
11 because they would occur at much higher doses than
12 the doses of interest in -- for radiation
13 protection.

14 But despite that, the national and
15 international organizations, such as the United
16 Nations Scientific Committee on the Effects of
17 Atomic Radiation, the ICRP, and the BEIR committee
18 that we heard about, continue to look at effects
19 other than cancer, for example, cardiovascular
20 diseases, to make sure that the risk factors on
21 which the limits are based continue to take into
22 consideration the developments in science.

23 And through the work of these
24 committees, the CNSC would continue to review that
25 work and if the scientific evidence for non-cancer

1 health effects were -- showed that effects would be
2 occurring at the lower doses, then the limits would
3 be revised to ensure that these effects are
4 covered.

5 But to date, all the evidence is
6 for miscarriages, cardiovascular diseases to occur
7 at much higher doses than the doses that are below
8 the dose limits set by the CNSC for workers and
9 members of the public.

10 In terms of the studies that have
11 been done in Canada around nuclear facilities, in
12 one of the reports we've provided to the panel
13 describes studies that have been done, both in
14 Ontario and Quebec, and also for nuclear energy
15 workers that are employed at all Canadian NPPs.

16 And the most recent study that
17 covers the region of Darlington and Pickering was
18 the study done by the public health officials of
19 Durham, where the health effects that have been
20 talked about over the last few days, such as
21 leukaemia in children, have not been observed to
22 occur at higher rates in the Pickering/Darlington
23 region, even though there are several reactors that
24 have been in operation for many years.

25 And similarly, the work that has

1 been done on nuclear energy workers where we have
2 very good dose information also shows that when we
3 do a comparison of workers with no exposures, low
4 exposures or higher exposures, that we don't see a
5 relationship between health and dose, and that
6 workers are as healthy as the general population or
7 even healthier than the general population.

8 The work that CNSC has done and/or
9 other agencies in Canada is essentially consistent
10 with what other agencies have found when all the
11 evidence and all the studies have been put together
12 and analysed where there is no evidence for
13 increased health risks around nuclear power plants,
14 essentially where nuclear facilities, essentially
15 because the doses are very low and they're much
16 lower than doses at which radiation has known
17 health effects.

18 MEMBER PEREIRA: So just to
19 confirm then, what you're saying is that at the
20 doses that are being encountered in this region,
21 around Darlington and Pickering, the analysis of
22 data on health of people in this region shows no
23 evidence of any impact of the radiation doses -- no
24 obvious signs of impacts from radiation?

25 DR. THOMPSON: Patsy Thompson, for

1 the record.

2 That's correct. The CNSC dose
3 limit, for example, for members of the public is 1
4 millisievert per year or 1,000 microsieveverts per
5 year, and the doses associated with the nuclear
6 facilities in Ontario, nuclear power plants, are in
7 the few microsieveverts range, so almost a 1,000
8 lower -- not 1,000, but 500 times lower than
9 nuclear facilities in Ontario.

10 Nuclear power plants are in a few
11 microsieveverts range, so almost a thousand lower --
12 or not a thousand, but 500 times lower than the
13 public dose limit.

14 And at those very low levels,
15 there is no evidence in any scientific studies
16 showing health effects at those levels.

17 And the experimental -- because we
18 have two sorts of data that we look at -- one is
19 epidemiological studies from populations or workers
20 or members of the public; and the other one is from
21 work that is done in the laboratory under
22 controlled conditions, and neither of those types
23 of studies show effects at -- at the very low doses
24 that are typical of -- for members of the public
25 and -- and workers around the nuclear facilities.

26 MEMBER PEREIRA: Now, based on the

1 sample sizes that you're talking about, would this
2 -- the numbers be high enough to give you reliable
3 conclusions because there are different constraints
4 on these studies sometimes with sample sizes being
5 too small to give you confident predictions?

6 Where do we stand on that -- on
7 that score?

8 DR. THOMPSON: Patsy Thompson for
9 the record.

10 The study done in -- in Durham
11 region was actually quite a good one because there
12 is a large population living around both Pickering
13 and -- and Darlington where there are a number of
14 reactors.

15 And that study has been done more
16 than once by the Durham region health officials and
17 the -- the patterns that are seen in the -- the
18 health of the community are quite typical of other
19 communities in -- in Ontario for the nuclear power
20 worker studies.

21 The studies were robust when we
22 look at total radiation dose. What we have
23 recommended -- and other organizations in the U.K.
24 and France have recommended, is for -- because
25 tritium is a very small component of that dose.

1 The total dose has very little
2 effect on health. So the tritium component would
3 have even less, but it's very difficult with the
4 number of workers in Canada to have an exact,
5 precise risk factor and so what has been
6 recommended is that an international study be done
7 to increase the number of workers because of the
8 low tritium exposures.

9 MEMBER PEREIRA: Thank you very
10 much.

11 Thank you, Mr. Chairman.

12 CHAIRPERSON GRAHAM: Madame
13 Beaudet?

14 MEMBER BEAUDET: Thank you, Mr.
15 Chairman.

16 Thank you for your presentation of
17 your concerns.

18 I'd like to go also with the
19 question to CNSC. "The Enemy Within," was that
20 based on cases in -- in the States or in Canada?
21 And I believe this was in the 1970s, which we have
22 hopefully progressed since then in how we design
23 the studies done and I'd like your comments,
24 please.

25 DR. THOMPSON: Patsy Thompson for

1 the record. We could check, but I don't have the
2 date of publication of that -- of that report, but
3 I do believe it's -- it's an American study.

4 MEMBER BEAUDET: Maybe,
5 Intervenor, do you know the "Enemy Within," if --
6 if it's an American book or Canadian?

7 MS. COCKBURN: Yes, Jay Gould, in
8 -- in combination with Dr. Sternglass and -- Dr.
9 Sternglass and Joseph J. Mangano, the radiation and
10 public health project.

11 And they did the study using the
12 -- the National Cancer Institute statistics in the
13 United States and they -- they had to use a larger
14 geographical area to -- I guess, to include the
15 statistical significance that you're talking about.

16 And when they -- you'll see from
17 that book that when they included a larger
18 geographical area to include enough people for
19 statistical significance, this -- this is what they
20 were -- were finding.

21 This is only one that I -- that I
22 mentioned, about the -- the breast cancer mortality
23 of women living within 50 and a hundred kilometres
24 of -- of the nuclear reactors.

25 And just to add to that about the

1 study that I mentioned about -- and I think Dr.
2 Thompson is referring to that.

3 When I -- when I mentioned about
4 the other studies of people living near nuclear
5 facilities, it is -- I do have the -- the study
6 here and I'm sure it's perhaps talking about the
7 one Dr. Thompson is talking about.

8 And it was indicated from my
9 understanding of my reading that there was an
10 increase of incidents of leukemia and these other
11 cancers that I mentioned and that was the study of
12 Clarke et al, "Childhood Leukemia Around Canadian
13 Nuclear Facilities".

14 So I don't know if it's an
15 interpretation by, you know, CNSC or the
16 interpretation by the person who I am understanding
17 -- who comes before me of the reading I did, but
18 anyways that -- that is the -- the study and I'm
19 not sure if it's the same that Dr. Thompson is
20 talking about, but that is the study I'm talking
21 about where it did show an incidence of increased
22 cancers of -- and birth defects -- increased
23 incidents.

24 MEMBER BEAUDET: Dr. Thompson?

25 DR. THOMPSON: Perhaps to -- to

1 clarify. The study by Clarke, it's one of the
2 studies that we've described in the undertaking.

3 The study showed not significant
4 increases and these studies were then followed up
5 by more studies that had -- were more robust and
6 the more robust studies that were used to follow up
7 on this finding, because we -- we wanted to go
8 further, also showed that the -- there was not a
9 significant increase in risk.

10 MEMBER BEAUDET: Thank you. Thank
11 you, Mr. Chairman.

12 CHAIRPERSON GRAHAM: Thank you,
13 Madame Beaudet.

14 Just one question and I guess
15 it'll be the same as C -- The National Cancer
16 Institute, that's an American organization, is it?

17 And Canadian Cancer Society -- in
18 checking the Canadian Cancer Society, they don't --
19 there isn't a reference to nuclear power and
20 nuclear -- or the nuclear industry.

21 They don't put it on as high a
22 ranking as they do cell phones and things like
23 that. That -- they, in fact, they -- they list
24 cell phones first.

25 Everyone has cancer on their mind.

1 Everyone is concerned about these studies and so
2 on, but I guess what -- the question I'm asking is,
3 around nuclear plants, is it proven anywhere by the
4 Canadian Society or by any other organization in
5 Canada that nuclear power plants in Canada, within
6 the 50 to 100-mile site, have a higher rate for
7 breast cancer mortality? Is that -- from Canadian
8 reactors, is that -- is that in any document?

9 DR. THOMPSON: Patsy Thompson, for
10 the record.

11 No, it's not, sir, and I believe
12 that the undertaking that was assigned to us
13 yesterday or -- in relation to looking at cancer
14 incidents from the national registries by region
15 would maybe help to clarify some of this -- of this
16 information, but to date all the studies that have
17 been done have not shown any increased risk that
18 can be attributed to radiation exposures around
19 nuclear facilities and, simply, because radiation
20 exposures are so very low.

21 CHAIRPERSON GRAHAM: Thank you.
22 With that, I will go now -- Mr. Pereira, you have
23 nothing else, or Madame Beaudet?

24 I will now go to OPG. Do you have
25 any questions or comments with regard to Ms.

1 Cockburn's presentation?

2 MR. SWEETNAM: Albert Sweetnam,
3 for the record.

4 No questions, but just a
5 clarification if I may?

6 CHAIRPERSON GRAHAM: Yes.

7 MR. SWEETNAM: The intervenor had
8 indicated that this was a proposal for a \$33
9 billion facility at the Darlington site. As put on
10 the record by the assistant deputy minister, the
11 \$33 billion is not for the Darlington site.

12 The \$33 billion is for the nuclear
13 program in Ontario in the next 15 to 20 years and
14 that program includes the refurbishment of 10
15 reactors, six at the Bruce site and four at
16 Darlington, and the two new reactors at the
17 Darlington site, and this whole nuclear program is
18 the -- the subject of the -- of \$33 billion in the
19 long-term energy plan.

20 Thank you.

21 CHAIRPERSON GRAHAM: Thank you,
22 Mr. Sweetnam.

23 CNSC, do you have anything further
24 to add?

25 DR. THOMPSON: Patsy Thompson, for

1 the record.

2 No, thank you.

3 CHAIRPERSON GRAHAM: Government
4 officials? Any government officials from
5 departments? No?

6 Then do we have any questions of
7 intervenors?

8 Mr. Kalevar?

9 --- QUESTIONS BY THE PUBLIC:

10 MR. KALEVAR: Thank you, Mr.
11 Chairman. Chiatanya Kalevar for Just One World.

12 Through you, Mr. Chair, to Dr.
13 Thompson and perhaps the presenter too.

14 The question is, low doses have
15 not shown any, how did you say, identifiable cancer
16 risk, or something to that effect. Shall I first
17 ask if Mister -- Dr. Thompson accepts that the --
18 any radiation dose is cumulative; and secondly,
19 that any radiation dose has latent impacts that it
20 may not reveal its impact right away.

21 So latency of impact and
22 cumulateness of impact, does she at least admit
23 that?

24 CHAIRPERSON GRAHAM: Mr. Kalevar,
25 I will decide who the questions go to.

1 MR. KALEVAR: Okay, fair enough.

2 CHAIRPERSON GRAHAM: And I will
3 ask Dr. Thompson to respond, but you direct them to
4 the Chair, please. We have gone through this day
5 after day. Thank you very much.

6 Dr. Thompson?

7 DR. THOMPSON: Patsy Thompson, for
8 the record.

9 I would first say that at doses
10 below about 100 millisevierts that there has not
11 been indications of levels of risk that are above
12 risk of populations not exposed to radiation.

13 But despite that, the CNSC uses,
14 as other regulators do, the linear no threshold
15 relationship as a prudent way of regulating the
16 industry to make sure that the doses are as low as
17 possible.

18 Doses are cumulative and the risk
19 assessments include the accumulation of dose from
20 radionuclides within the body over the lifetime of
21 a person, and so doses are cumulative and many
22 diseases have a latency period, so the risk
23 assessments, when we look at the relationship
24 between radiation exposure and a disease like
25 cancer, we have to take into consideration latency.

1 CHAIRPERSON GRAHAM: Thank you.
2 That finalizes the presentation.

3 And I apologize, I have been
4 calling you Ms. Cockburn, and it's -- I'm used to
5 that. I have neighbours that are spelled the same
6 way and that is what we call them in New Brunswick,
7 and I believe the pronunciation is Cockburn.

8 So thank you very much for coming
9 and we appreciate your intervention.

10 The next on the agenda is Dr.
11 Jamie [sic] Carter, which is found under PMD 11-
12 P1.127.

13 Dr. Carter, if you would come
14 forward, please, and we will have your
15 presentation.

16 And again I apologize, it's Janey
17 [sic] Carter, Dr. --

18 DR. CARTER: Janine.

19 CHAIRPERSON GRAHAM: Janine.
20 Janine, thank you very much.

21 --- PRESENTATION BY DR. CARTER:

22 DR. CARTER: Okay, thank you.
23 Yes, my name is Janine Carter. Good afternoon.

24 I am here because I am concerned.
25 I am very concerned about the reckless use of a

1 very dangerous technology close to where my family
2 lives, too close to where my children live, too
3 close to where my nieces and nephews live, and far
4 too close to Toronto, the largest city in the
5 country.

6 This technology, of course, is
7 nuclear power. We should not be building new
8 reactors, instead we should be planning how to wind
9 down operations in those reactors we already have.

10 My interest in nuclear power is
11 longstanding. My father, Cyril Carter, was a
12 nuclear physicist. He worked in the first -- it
13 was actually the first nuclear power plant in
14 Europe. That was the Harwell Nuclear Station, and
15 that's near Oxford in England.

16 After a few years there he became
17 concerned about problems with the technology, and
18 eventually he left England and he came to teach at
19 Trent University, where he spent the rest of his
20 life researching solar power and other alternatives
21 and speaking out against nuclear power.

22 Okay. So he was an expert in it,
23 but you don't need to be an expert in nuclear power
24 to see that building nuclear plants is a mistake.
25 You just need to see beyond the pro nuclear

1 propaganda that we are constantly bombarded with.

2 I have found that most people I
3 talk to know very little actually about nuclear
4 power. They may think it's a good thing because
5 they have seen the television advertisements,
6 you've all seen those, made by the Canadian Nuclear
7 Association -- I guess they are up later, right --
8 or other propaganda favouring the technology.

9 These would lead you to believe
10 that nuclear power is the solution to global
11 warming, or if not, the greatest thing since sliced
12 bread. We are told it's safe, clean and cheap.

13 I believe that very few people
14 would want nuclear power if they knew the truth
15 about it because the truth is that it is incredibly
16 dangerous, dirty and expensive, more so than any
17 other way of generating electricity.

18 Nuclear power is dangerous mainly
19 because it uses fuel which is radioactive, and it
20 produces much more radioactivity since the products
21 of the fission reaction are radioactive.

22 We humans cannot see, hear, smell
23 or feel radioactivity, but it can, nevertheless,
24 hurt us. Some species can detect radiation, rats
25 for example.

1 Because we cannot detect it
2 without a Geiger counter or other measuring device,
3 we do not know it is there, therefore it is easy to
4 pretend it is not and attribute any problems to
5 other causes.

6 It is also easy for the nuclear
7 industry to be less than open about how much
8 radioactivity they are releasing into the
9 environment and how dangerous it really is.

10 To really assess the risk we would
11 need to do long-term studies with large population
12 samples having known radiation exposure.

13 Adequate studies like this have
14 not been done, but we do know that large doses
15 cause radiation sickness and smaller ones problems
16 including cancer and birth defects.

17 We also know that there is no safe
18 level of radiation, but that higher levels and
19 higher length of exposure cause more problems.

20 It would therefore seem prudent to
21 minimize our exposure as much as possible and not
22 use technologies which are likely to massively
23 increase the amount of our radiation exposure.

24 Okay. One big problem with
25 nuclear power is the link to nuclear weapons.

1 Nuclear energy was originally conceived as a way of
2 harnessing the power of the atom in a peaceful way,
3 as opposed to making -- using it to make bombs like
4 those dropped on Hiroshima and Nagasaki at the end
5 of the Second World War.

6 Atoms for peace was a seductive
7 idea and many, including many survivors of the atom
8 bomb, thought it would be wonderful if something
9 positive could come from all that suffering. This
10 is a tragic irony, considering the current ghastly
11 situation in Japan.

12 The links with the weapons
13 industry were never really broken, and in fact
14 nuclear power has contributed to the proliferation
15 of nuclear weapons.

16 Nuclear weapons use Uranium and/or
17 Plutonium, as do nuclear reactors. Canada is a
18 major source of Uranium. Some is used to make
19 bombs and some to fuel reactors.

20 Countries such as Pakistan, India
21 and North Korea have joined the nuclear club with
22 the help of nuclear energy technology, and who
23 knows, Iran may be next.

24 Thus, the threat of nuclear war is
25 still very much with us, and, if anything, more

1 serious than ever. There are enough nuclear
2 weapons to kill all of us on earth many times over
3 and render the planet uninhabitable.

4 It could be argued convincingly
5 that nuclear weapons are an even greater threat to
6 us than global warming. This connection alone
7 should be reason enough to stop using nuclear
8 energy.

9 Then there is the risk of
10 catastrophic accident or attack. We are witnessing
11 now in Japan what can happen when something goes
12 terribly wrong in a nuclear plant.

13 The radiation released from such
14 an accident can be much greater than that from an
15 atomic bomb since the radiation level builds up as
16 the reactor runs and radioactive waste products are
17 often stored nearby.

18 We can introduce as many safety
19 measures as we like, but we can never eliminate
20 entirely the risk of an accidental meltdown or
21 massive release of radiation.

22 This is because nuclear power is
23 essentially the same technologies that are used in
24 a nuclear bomb, but in a reactor the process must
25 be constantly slowed down and cooled to prevent a

1 runaway reaction or meltdown.

2 A couple of weeks ago I saw a
3 video on one of my classes about what would happen
4 if all of the human beings suddenly disappeared
5 from the planet. I did not find the scenario very
6 realistic. Why would all the other species still
7 be there if we were gone?

8 But one thing that did grab my
9 attention was the fact that without humans to
10 monitor them, all the nuclear reactors on earth
11 would meltdown and spew massive amounts of
12 radiation everywhere.

13 All that is required to cause a
14 problem here is neglect or inattention, an active
15 mistake or an act of sabotage could do it too, but
16 it is not required.

17 What this means is that whenever
18 some kind of disaster, natural or otherwise
19 happens, it is liable to be compounded by
20 additional problems with atomic power stations.

21 This is precisely what has
22 happened in Japan at the Fukushima reactors near
23 Sendai. There were many safeguards in place, but
24 they were all overwhelmed by the earthquake and
25 resulting tsunami.

1 elevated radiation levels in the water were
2 detected a week after the tsunami.

3 And Kiev, the capital of Ukraine
4 is about 100 kilometres away from the site of the
5 Chernobyl accident.

6 A major accident at the Darlington
7 Plant would affect millions of people in Ontario.
8 And one at the Pickering site would be even worse
9 since it is closer to the Greater Toronto area, the
10 most populated area in the country.

11 We could suffer anything from a
12 quick, but not quick enough death from radiation
13 poisoning to cancer, to birth defects afflicting
14 our descendants throughout the generations.

15 Radiation would spew into Lake
16 Ontario, which is the source of drinking water for
17 millions. Thousands or perhaps millions would have
18 to be evacuated from their homes, many permanently.
19 We should think about this now and ask ourselves if
20 the risk really worth it.

21 Okay. Then there is the
22 uranium mining. Nuclear power relies on uranium to
23 fuel the reactors. The mining of uranium has
24 caused much hardship and disease to people
25 unfortunate enough to live nearby, and especially

1 to those hired to work in the mines.

2 Most of these people have little
3 idea of the risk until they get sick. Many of them
4 are Canadian First Nations people. This is
5 unacceptable.

6 Furthermore, the supply of uranium
7 is not inexhaustible and as we use lower quality --
8 or we must use more energy, which is usually fossil
9 fuels to process it. Nuclear power is not a
10 sustainable or a clean energy source.

11 Then there is the financial costs,
12 which I will not go into detail about, but sufficed
13 to say that nuclear reactors cost billions to
14 build; billions more to decommission when their
15 life is over, if that can be done.

16 And construction of nuclear plants
17 in Ontario has in every case has been overtime and
18 overbudget. We are still paying for previous
19 nuclear construction costs on our hydro bills
20 today. Nuclear power is definitely not cheap.

21 If that weren't enough, there is
22 the radioactive waste. All nuclear reactors
23 produce radioactive wastes, which remains
24 radioactive and therefore deadly for up to a
25 million years.

1 At present we have no way to
2 neutralize it and nowhere to keep it. Currently
3 most of it is kept in a swimming pool or in a dry
4 storage cask near the reactor, which makes any
5 accident at the reactor potentially even more
6 serious.

7 Ideally we would put the waste
8 somewhere where it would be safely out of the way
9 for a million years and yet readily accessible in
10 case we find a way to render it harmless.

11 Does anyone really believe this is
12 possible? This is a terrible legacy to leave our
13 descendants. We should stop until we find a safe
14 way to deal with this problem.

15 Then there are alternatives.
16 Renewable energy sources, such as solar power, wind
17 power and geothermal power have none of the above
18 disadvantages. Combined with energy conservation,
19 just using less, they are the real solution to
20 global warming.

21 We are told that they can not fill
22 the gap left by fossil fuels, but why should we
23 believe this coming from the same people who tell us
24 nuclear power is safe?

25 These technologies are all

1 improving rapidly and if we spent on them all the
2 money we currently throw down the black pit of
3 nuclear power, they would do even better.

4 In conclusion, nuclear power is
5 neither safe, clean, nor cheap and it will not solve
6 the problem of global warming.

7 An accident at the Darlington or
8 Pickering Plants could cause suffering on an
9 unimaginable scale. Even without an accident, we
10 have no way of dealing with the lethal and long-
11 lasting waste products.

12 It is therefore irresponsible to
13 continue using this technology and plans to expand
14 it are criminally irresponsible if not insane.

15 Some of us have been aware for a
16 long time of the risks involved in nuclear power and
17 have spoken out against it at every opportunity.
18 Others have preferred not to know. They have hidden
19 their heads in the sand.

20 The tragedy unfolding in Japan
21 surely must make these risks harder to ignore.
22 Let's stop before it's too late. Let's forget about
23 further expansions to the Darlington Plant and to
24 all other nuclear power stations.

25 Let's make plans to decommission

1 them as soon as possible and instead rely on
2 conservation, intelligent building design. A lot
3 can be done there. And renewable energy sources
4 such as hydropower, solar power, wind power and
5 geothermal power. These are the way of the future.

6 Thank you.

7 CHAIRPERSON GRAHAM: Thank you
8 very much, Dr. Carter.

9 I will now go to members of the
10 Panel. Madam Beaudet, you are the first member.

11 --- QUESTIONS BY THE PANEL:

12 MEMBER BEAUDET: Thank you, Mr.
13 Chairman.

14 You did mention that your father
15 was involved in solar research or wind research --

16 DR. CARTER: Mostly solar
17 research.

18 CHAIRPERSON GRAHAM: Microphone.

19 DR. CARTER: Yeah, mostly solar,
20 yeah.

21 MEMBER BEAUDET: Solar and wind?

22 DR. CARTER: Mostly solar, yeah.

23 MEMBER BEAUDET: Oh, okay, because
24 we -- as, you know, we have a lot of interventions
25 that mention that we should go for alternatives.

1 DR. CARTER: Yes.

2 MEMBER BEAUDET: And wind and
3 solar, some of the proposals. And the thing is if
4 you look at 14,000 megawatts and let's say you take
5 wind turbines that can produce 2,000 megawatts with
6 a utilization factor of -- in general it's between
7 32 and 33 percent, that's a lot of turbines.

8 DR. CARTER: I'm not suggesting we
9 get all the power we need from wind turbines, but
10 we could do more there.

11 I don't understand people who
12 protest against wind turbines when they have a
13 nuclear reactor on their doorstep like what has
14 been happening lately.

15 MEMBER BEAUDET: Yeah, it has been
16 happening --

17 DR. CARTER: Yeah.

18 MEMBER BEAUDET: -- and that's why
19 I'm asking the question.

20 DR. CARTER: Yeah.

21 MEMBER BEAUDET: Because a two-
22 megawatt turbine is -- or a three-megawatt turbine,
23 because they're getting bigger over the years, is
24 135 metres high, and the blade radius is about 110
25 metres high. So if you --

1 DR. CARTER: Are -- are you saying
2 that's too big then?

3 MEMBER BEAUDET: Well, if you're
4 on a farm, living in a small house, it's rather
5 massive in your garden.

6 DR. CARTER: Right. Right.

7 MEMBER BEAUDET: Yes. So we're
8 just trying to understand, it's fine to propose
9 alternatives, but --

10 DR. CARTER: Yeah.

11 MEMBER BEAUDET: -- we're trying
12 to understand the -- the reasoning behind it. I'm
13 not saying nuclear is better or not better, but I'm
14 just trying to understand -- I mean, we've had
15 hundreds of proposals for green energy, and fine,
16 but there are constraints as well and I'd like to
17 hear your opinion on that.

18 DR. CARTER: I'm not pushing any
19 particular kind of wind turbine. We could have
20 smaller ones and in different places, you know.
21 I'm not trying to push that particular plan. And
22 that would just be one part of the mix.

23 MEMBER BEAUDET: I think if --
24 well, some people have come in and proposed a smart
25 grid, for instance, and I think if you're in a

1 remote area you can look at having smaller
2 turbines, yes.

3 But I think if you want to have
4 base-load electricity, you would have to go for
5 industrial type of windmill farm, and -- in Europe,
6 like in India or in Denmark, they're offshore, so
7 it's --

8 DR. CARTER: Yeah, there's a lot
9 of potential --

10 MEMBER BEAUDET: -- different
11 impacts, but --

12 DR. CARTER: -- there.

13 MEMBER BEAUDET: -- there's -- I
14 don't think there's as much resistance for people.
15 But here, if you put, let's say, 5,000 turbines on
16 Lake Ontario, it's -- you know, that -- because
17 usually the wind is where the water is. You have
18 to remember that.

19 The wind is better where the water
20 is, so I was just trying to understand a bit more.
21 Obviously you've grown in university milieu and
22 maybe you could have brought some insight into
23 this.

24 DR. CARTER: Again, no particular
25 kind of wind turbines, definitely there's a

1 potential there, but we don't have to put a big one
2 in your backyard.

3 MEMBER BEAUDET: Thank you. Thank
4 you, Mr. Chairman.

5 CHAIRPERSON GRAHAM: Thank you,
6 Madam Beaudet.

7 Mr. Pereira?

8 MEMBER PEREIRA: Thank you, Mr.
9 Chairman.

10 For many of the intervenors who
11 have come before us, the events in Japan have, I'm
12 afraid, coloured the way they react to risks and
13 hazards.

14 And on the second day of our
15 hearings, we had a seismologist from the Geological
16 Survey of Canada who came here and talked about the
17 risks of earthquakes in this part of Ontario, and
18 what was comforting, that based on the information
19 -- the data that's available on risks in Ontario,
20 we certainly are not in a zone where we would get
21 earthquakes as large as the one that was
22 encountered at Fukushima.

23 And also in the environmental
24 impact statement that Ontario Power Generation has
25 prepared, the risks of tsunamis are not high. So

1 that type of accident is -- seems to be highly
2 unlikely.

3 There may be other types of
4 accidents that you might want to suggest, but in
5 the analyses of accidents, the Ontario Power
6 Generation's analysed severe accidents that result
7 in releases and they look at the consequences of
8 those accidents and the -- the emergency measures
9 that would be in place in Ontario, and so we've
10 considered some of those implications.

11 But looking forward to how we
12 address this, we're taking all these inputs, the
13 suggestions and alternatives, but we're looking
14 primarily at the environmental impact of
15 constructing new generating -- nuclear generating
16 reactors at Darlington.

17 That's our mandate. We've got
18 some guidelines and that's what we're looking to --
19 to look and see whether the construction of
20 reactors would have a significant impact on the
21 environment. What impact it would have on the
22 environment in the vicinity of the station and on
23 the health of people in the vicinity of the
24 station.

25 DR. CARTER: Can I say something?

1 Yeah. I'm not saying we're going to have the same
2 thing here that happened in Japan, but I'm saying
3 if something does go wrong, the consequences are so
4 catastrophic, that why would we want to risk it at
5 all?

6 And, you know, you -- the chances
7 of winning the lotto 6/49 are 1 in 14 million, we
8 still buy tickets, right? So it could happen.

9 And in fact with the number of
10 reactors around the world, it was bound to happen
11 somewhere. So Japan is where it happened.

12 And we do have some earthquakes in
13 the area, not like they have there, that's true,
14 but it's not the only thing that can cause an
15 accident, right?

16 CHAIRPERSON GRAHAM: Thank you,
17 Mr. Pereira.

18 Just a couple of points. Always
19 very interested in alternate power and wind and
20 solar and so on, and you do mention -- also do
21 mention hydro electric.

22 And hydro electric doesn't come
23 without some major environmental damages also, when
24 you look at a lot of lands that are flooded and
25 then the ecological effect it is on wildlife and

1 fish and so on.

2 So all of these things come with
3 some warts and bruises, and I guess it's to figure
4 out which -- which way you go and what the
5 alternatives are.

6 You did mention if everyone would
7 put up a windmill -- or a wind turbine, small one,
8 you could do that, but wind is certainly something
9 that is being tried right across the country, but
10 it's coming with opposition also.

11 So I just -- we have listened over
12 the last two weeks to all sorts of suggestions, and
13 it's to sort those out and so on as to how they fit
14 in the big scheme of things, and as an example, you
15 talk about uranium, and I think it was answered
16 several times about the supply uranium.

17 Canada's only the -- is now only
18 the third largest producer of uranium in the world.
19 It's not the largest. Australia, I think, is
20 first, and so on. But, you know, there are
21 deposits -- in your statement you said about low-
22 grade uranium.

23 Yesterday we heard that Cigar Lake
24 has in excess of 20 percent uranium in the ore
25 body.

1 So all of these things we have to
2 consider. And what I -- I really am interested in
3 is to know the big thing that we hear is accident
4 from nuclear, and that's really what you have to
5 look at, the accident, the potential of accidents
6 and so on, the potential of accident attacks
7 because of terrorism, and we've mentioned that,
8 that that has to be looked at in an in-camera way
9 because of the fact that it is security and some of
10 these things -- that precautions are being taken.
11 We don't want the whole world -- the officials
12 don't want the whole world to know what precautions
13 they take.

14 But nevertheless, your
15 presentation today is very, very sincere and very
16 well on the mark, and it's come over to us over the
17 last two weeks, many of these the same way that
18 you're asking us to look at other alternatives,
19 which, today, what are -- what this EA is doing is
20 looking at the aspects of a new build at
21 Darlington, and Darlington alone, and many people
22 once looked at the bigger picture, but we have to
23 look at -- at what our scope is and what our
24 mandate is, and we appreciate your comments this
25 morning -- or this afternoon.

1 We now go to questions. OPG, do
2 you have any questions?

3 MR. SWEETNAM: Albert Sweetnam.
4 No questions.

5 CHAIRPERSON GRAHAM: CNSC, do you
6 have any questions?

7 DR. THOMPSON: Patsy Thompson.
8 No, thank you.

9 CHAIRPERSON GRAHAM: Government
10 officials, which there are none. We've done that
11 before today.

12 And we have one question from an
13 intervenor, and that's Mr. Kalevar.

14 --- QUESTIONS BY THE PUBLIC:

15 MR. KALEVAR: Thank you, Mr.
16 Chairman and through you and to the presenter.

17 You mentioned that adequate
18 studies have not been done in Ontario on radiation
19 and the diseases it causes. Do you have any idea
20 as to why Ontario Hydro, the previous proponent to
21 OPG, had failed in doing that?

22 I have my own information I will
23 share with you later, but go ahead.

24 CHAIRPERSON GRAHAM: Dr. Carter,
25 if you'd care to turn on the mike when you go.

1 DR. CARTER: Oh, I didn't know it
2 was off. You'd have to ask Ontario Hydro, but
3 maybe they're rather we didn't know more about
4 that.

5 There have been some studies done
6 in other places which have shown no effects, you
7 know. If you look at the cows that graze near the
8 station and then you trace the milk to who drinks
9 the milk and check the cancer rates, things like
10 that. I can't give you the -- the details on the
11 study now, but if you're interested I can track
12 that down.

13 And -- but of course, we know what
14 happens when there's a catastrophic accident such
15 as in Chernobyl, so for me that's bad enough.

16 CHAIRPERSON GRAHAM: Thank you
17 very much, Dr. Carter, and thank you very much for
18 coming today. And we always appreciate every
19 intervenor and you did supply us with a lot of
20 knowledge which we really appreciate. Thank you
21 very much and safe travels.

22 The next intervenor that we have
23 is Nadine Hawkins. And, Ms. Hawkins, your
24 intervention is listed under PMD 11-P1.207.

25 Ms. Hawkins, the floor is yours

1 and welcome.

2 --- PRESENTATION BY MS. HAWKINS:

3 MS. HAWKINS: Good afternoon,
4 Panel. My submission requested licencing be
5 rejected at this time for many reasons.

6 CHAIRPERSON GRAHAM: Madam
7 Hawkins, just a little closer and pull it up. I
8 don't think we're hearing you as loud. Thank you.

9 MS. HAWKINS: My submission
10 requested licencing be rejected at this time for
11 many reasons, including the unusual timing of the
12 licencing, health concerns, costs and inappropriate
13 planning for waste disposal.

14 I hold the panel responsible for
15 any reasonable expected consequence of licencing
16 and ensuring an appropriate effort has been made in
17 planning this facility.

18 I spend a lot of my time talking
19 to people since I've been politically involved for
20 a decade and also do related research.

21 Some people feel very strongly
22 about not using nuclear energy, but they may not be
23 part of -- or they may be part of the silent
24 majority.

25 People around the world are

1 responding to the lessons of Japan's nuclear
2 accident which has been rated at a six or seven by
3 some experts on an international scale of up to
4 seven.

5 Radiation from that plant has made
6 its way into the soil, the food chain, and even the
7 tap water 220 miles south.

8 Nations worldwide have declared
9 reviews and moratoriums including the United
10 States, the European Union, Germany, Switzerland,
11 China, Taiwan and South Korea.

12 In Germany, 60,000 people
13 protested against extending the lifespan of
14 Germany's 17 nuclear power stations by 12 years,
15 and it appears to be an election issue.

16 Since one of the three official
17 status political parties in Ontario has declared
18 nuclear energy a huge financial sinkhole, it looks
19 like that the people of Ontario will get the
20 opportunity to choose whether to give the
21 government a mandate for nuclear energy.

22 I feel that the will of the people
23 should be respected. If you incur additional costs
24 at this point without listening to the voter first,
25 you will be treating them with disrespect and that

1 has consequences.

2 Canadian nuclear reactors release
3 radiation into the air and water that can lead to
4 cancer, birth defects and developmental or genetic
5 effects.

6 In a report by Dr. Ian Fairlie in
7 2007, it noted Canadian nuclear stations release
8 considerably larger amounts of tritium than other
9 countries even before considering accidental
10 releases.

11 He noted tritium concentrations in
12 drinking water, in air and in vegetation and food
13 near CANDU stations are all significantly
14 increased.

15 This, in turn, results in high
16 tritium intakes in residents living within five to
17 ten kilometres of CANDU reactors and very high
18 tritium intakes in residents who live within one to
19 two kilometres.

20 Studies of why there were
21 increased infant mortality, Down's Syndrome and
22 leukemia around nuclear plants were not conclusive,
23 but do indicate a need for stronger research.

24 The panel would need to address
25 this responsibility if even only one person were

1 harmed because there are alternatives to nuclear
2 energy.

3 There is clearly a case for
4 significant energy conservation in Ontario in
5 comparison to many other wealthy, developed
6 nations, Canada is still fairly wasteful.

7 Some people feel strongly about
8 the deficit in Ontario and would clearly prefer
9 energy conservation to the proposed 26 billion
10 expenditure on nuclear reactor add-ons.

11 They're concerned that we are
12 still paying for cost overruns on the older plants
13 and will now also have to pay on the new reactors
14 through never-ending debt retirement on our bills
15 or government budget transfers of our tax dollars
16 to the nuclear industry.

17 Subsidies artificially lower the
18 cost of production and boost profits for already
19 profitable nuclear energy, leaving green energy
20 projects at a competitive disadvantage.

21 Taxpayers also do not understand
22 why Ontario has to subsidize neighbouring
23 electricity users in the U.S.A. and Quebec.
24 Subsidies to offload excess electricity have
25 amounted to about one billion charged to taxpayers

1 since 2006, according to Peter Tabuns.

2 If we did not have big box or
3 centralized energy, we could manage our production
4 in our best financial interest.

5 Decentralized energy has lower
6 energy line loss, allows closer end user control
7 and would increase jobs in Ontario.

8 In many types of green energy, the
9 capital cost is often paid privately in exchange
10 for higher future revenues under a feed-in tariff
11 program.

12 According to the CanSIA website,
13 solar PV is currently competitive during peak
14 hours, from 11:00 to 6:00, when the sun is shining
15 and we need it. The sun is normally shining
16 somewhere in Ontario.

17 With substantial world investment
18 that is happening now in solar PV, it is likely to
19 get up to 50 percent cheaper.

20 While Ontario is investing in a
21 green energy, it still falls far behind most other
22 developed nations, although the supplier interest
23 is clearly there.

24 I believe this panel should
25 investigate current cost expectations of

1 alternative energies versus nuclear.

2 This type of planning and review
3 is mandatory before a \$26 billion expenditure is
4 entered into. Anything less would be irresponsible
5 of the magnitude of the decision to continue
6 development of the new Darlington reactors.

7 Further, actions on this project
8 are extremely expensive to the taxpayer and warrant
9 a definitive final plan.

10 In fact, we do not even know which
11 specific reactor is being built on that location
12 and that should be known before plans go forward.

13 Decentralized, cleaner energy
14 alternatives are now coming in at lower prices.
15 They provide the jobs the economy needs right now
16 and would not be as exposed to the need for backup.

17 The climate is changing now, more
18 rapidly than expected. Darlington is on a fault
19 line and Ontario was subjected to earthquakes
20 recorded at unprecedented magnitude five in the
21 last year.

22 As seen in Japan, costs and
23 damages will occur when energy is of a centralized
24 nature and there is no ability to deal with that
25 risk.

1 There are no costed plans or risk
2 assessment for the impact of any failures on the
3 five million people who live within 100 kilometres
4 of the Pickering and Darlington stations, and there
5 should be.

6 It's not possible to estimate the
7 impact of water toxicity to Lake Ontario, which
8 feeds the Saint Lawrence and impacts on Canadian
9 and U.S. population and economy vigour, that
10 impacted by the Japan and Chernobyl disasters.

11 The Great Lakes are already
12 contaminated increasingly by industrial chemicals
13 and pharmaceuticals that municipal water treatment
14 plants were not designed to remove from our tap
15 water.

16 There should be consideration of
17 the expected cumulative impact of toxins, such as
18 background radiation and water quality. There is
19 no plan or consideration of this, even by the
20 suppliers.

21 In addition to failures and
22 natural disasters, there is a strong risk of
23 terrorism in a world with increasing conflict and
24 desperation.

25 Unlike decentralized energy,

1 nuclear is open to terrorism. The older units at
2 Darlington may only be designed to withstand the
3 impact of a small Cessna, as opposed to a Boeing
4 757 or 767.

5 The safety of the entire facility
6 should be considered when making this type of
7 additional investment. It needs to be safe for the
8 workers to go to.

9 With the fall of the Federal
10 Government on the contempt of parliament charge,
11 Bill C15, the nuclear liability in compensation act
12 planning has not been passed into law and has at
13 least been delayed.

14 The suppliers do not know their
15 liability and the tax payers are left to pay
16 whatever damages that they expect you, the joint
17 review panel, to protect them from.

18 The report of the Royal Commission
19 of the electric power planning written in 1980
20 recommended that if progress in high level nuclear
21 waste disposal research and development in both the
22 technical sense and social sense is not
23 satisfactory by at least 1990, as judged by the
24 technical and social advisory committees, the
25 provincial and federal regulatory agencies and the

1 people of Ontario, especially in those communities
2 that would be directly affected by a nuclear waste
3 disposal facility, a moratorium should be declared
4 on additional nuclear power stations.

5 While there may be plans, nothing
6 has been tested for high level nuclear waste. Like
7 nuclear waste, we had deep storage plans for CO2,
8 but when the storage site was tested on the Weyburn
9 farm there was no containment.

10 In addition, the likelihood of
11 transportation accidents on a probability basis had
12 never been considered as part of the cost of a
13 nuclear facility, but it can be estimated based on
14 actual experience over the past 30 years.

15 It is critical to safeguard the
16 public against containment problems with the
17 transportation and storage of nuclear waste and
18 include best estimates of all needed
19 decommissioning costs in the investment plan.

20 Without a functioning process, the
21 government is responsible to place additional
22 reliance on alternative safer energies.

23 I request the panel not approve
24 new reactors until nuclear liability legislation be
25 aligned with the polluter pays principle, and the

1 liability cap on nuclear operators and suppliers is
2 removed because costs and damages that are
3 estimable may otherwise be excluded from
4 consideration.

5 I request the panel consider all
6 costs, including bidding on a polluter pays basis,
7 decommissioning, added health expenses, reasonably
8 expected accidents in operation, storage,
9 transportation and terrorist attacks based on an
10 over 30-year nuclear energy history and a
11 reasonable probability.

12 CHAIRPERSON GRAHAM: Thank you
13 very much, Ms. Hawkins.

14 The floor is now open to questions
15 from the panel members and I will start with Mr.
16 Pereira.

17 --- QUESTIONS BY THE PANEL:

18 MEMBER PEREIRA: Thank you, Mr.
19 Chairman.

20 I will respond to a couple of the
21 points -- recommendations you have made. One is
22 considering the funding of decommissioning and
23 waste storage.

24 This is now a requirement in
25 Canada under the regulation by the Canadian Nuclear

1 Safety Commission, that operators of nuclear
2 facilities have to fund the decommissioning and the
3 storage of waste up front before they start
4 operation of reactors, so their funding has to be
5 put into a separate fund.

6 And earlier in these hearings Mr.
7 Sweetnam from Ontario Power Generation explained
8 how that funding is put in a segregated fund. A
9 segregated fund meaning that Ontario Power
10 Generation has no further access to those funds,
11 nor does the Province of Ontario.

12 So the money has to be put into
13 the fund and we were -- we were given an
14 explanation by the CNSC that every five years, or
15 maybe more frequently than that, the estimate of
16 required funding for decommissioning and waste
17 storage, waste management, is re-examined as part
18 of the regulatory process, and if necessary the
19 amount of funds placed in the segregated fund are
20 increased to ensure that funding is not -- the
21 funding of decommissioning and waste management is
22 not a burden on future generations.

23 So what it means is that the
24 operators of the nuclear facilities have to pay up
25 front for those costs.

1 Now I'll go to the CNSC and ask
2 about transportation of waste in Canada. And over
3 the past 30 years or longer, what is the experience
4 of the safety incidents, impacts on the public and
5 on the environment from the transportation of
6 radioactive waste?

7 MR. HOWDEN: Barclay Howden
8 speaking.

9 The -- as we spoke about before,
10 the transportation is regulated under *The*
11 *Transportation of Dangerous Goods Act* and the
12 packaging and transport of nuclear substance
13 regulations under *The Nuclear Safety and Control*
14 *Act*.

15 Over the past 30 years there have
16 been no incidents that have resulted in releases
17 into the environment or impacting on people in
18 Canada. I believe OPG presented their accident
19 statistics of only five accidents within a 35-year
20 period.

21 Additionally, we also talked about
22 the requirements for the different types of
23 transport for low and intermediate level waste, and
24 the safeguards that are needed to move those
25 wastes.

1 We also indicated that high level
2 waste is moved very rarely in Canada, on an average
3 about five times a year, and that would be the
4 transfer of a fuel bundle normally from a power
5 plant up to the Chalk River site, and that is done
6 with the specially built flasks, including a
7 transport license that includes a security plan and
8 notification for the police and fire forces along
9 the route so all the systems are in place.

10 But in Canada there is about one
11 million -- one million shipments of radioactive
12 material on a yearly basis being done.

13 A lot of it is medical isotopes,
14 but over the course of the year there are very few
15 accidents and there's been no impact on people or
16 the environment.

17 MEMBER PEREIRA: Another concern
18 raised by the intervenor is in the area of security
19 and risks to nuclear facilities from terrorist
20 attacks.

21 And I appreciate that security
22 matters cannot be discussed in detail in a public
23 meeting, but what can you tell us, as a regulator,
24 on how Canadians can be assured about protection of
25 nuclear facilities in Canada?

1 MR. HOWDEN: Thank you. Barclay
2 Howden speaking.

3 We've always had nuclear security
4 regulations which were upgraded after the 9/11
5 attacks. The basic requirements under those
6 regulations that the facilities have to -- have to
7 be able to defend against what is called a design
8 basis threat.

9 That threat is set by the CNSC in
10 conjunction with the RCMP and CSIS, who are our
11 intelligence partners, and the licensees have to do
12 what is called a threat risk analysis to
13 demonstrate that their physical security measures
14 are able to withstand an attack that has been
15 designed -- that has been outlined in the design
16 basis a threat.

17 MEMBER PEREIRA: Thank you. And
18 are there any security forces in the station to
19 protect against intrusions?

20 MR. HOWDEN: Barclay Howden
21 speaking.

22 There are two types of security
23 forces. There are the nuclear security guards, I
24 think they're called and then there's the nuclear
25 response force, which is designed to be able to

1 deal with these events.

2 They do drill on a regular basis
3 and they also do quite a bit of work with the
4 United States to learn the lessons learned from the
5 United States because they've had response forces
6 in place for a longer time than the Canadian
7 facilities.

8 MEMBER PEREIRA: Now, just one
9 more point of information.

10 Previous intervenors have come to
11 us and said -- talked about Darlington being built
12 on a fault line and we posed that question to
13 Ontario Power Generation earlier in these hearings
14 and they had their geological expert here,
15 consultant. And they presented information that
16 showed there's no geological fault at Darlington.

17 And prior to that, we had the
18 seismologists from the Geological Survey of Canada,
19 which is part of Natural Resources Canada, who gave
20 us an extensive presentation on Tuesday last week
21 on the seismic hazard in Ontario. And that
22 presentation as well showed no fault under the
23 Darlington station.

24 CHAIRMAN GRAHAM: Thank you, Mr.
25 Pereira.

1 Madame Beaudet?

2 MEMBER BEAUDET: Thank you, Mr.
3 Chairman.

4 On the first page of your
5 presentation under the title "Political
6 Responsibility", if you go more or less second
7 paragraph when you say, "And most importantly", you
8 mention here that, and I'll quote you:
9 "...there is now rushed licensing now just a few
10 months before an election for untested nuclear
11 designs."

12 First of all, you mean the
13 provincial election, or -- yes. Because this was
14 submitted even before Japan, Fukushima, happened.

15 What do you mean here by "untested
16 nuclear designs"? Do you mean one of the
17 technologies that we have to review is still --
18 hasn't completed the test?

19 CHAIRMAN GRAHAM: Pardon me.
20 Would you put your mic on, ma'am, please?

21 MS. HAWKINS: The reactors are new
22 reactors. They're new models.

23 MADAM BEAUDET: I'd like to go to
24 CNSC, please.

25 I believe last week we did get a

1 review of the different phases that are voluntary,
2 first of all, to come under review of the CNSC and
3 also, I presume, the licensing process, which is
4 compulsory to meet certain standards like the 337.

5 Maybe you should give a broad
6 picture of what happens. And when we say here for
7 untested nuclear designs, what does it mean?

8 MR. HOWDEN: Barclay Howden
9 speaking.

10 I'll provide an overview and then
11 ask Dave Newland to talk about what experience we
12 have with these designs so far.

13 So the overall regulatory process
14 is -- the start is with the environmental
15 assessment, which is what we're doing today and as
16 well as considering a licence to prepare site,
17 which is to allow the site to be prepared.

18 After that, which would be in the
19 future at some date if the project were to proceed,
20 is the licence to construct, which is where the
21 detailed designs come in and the safety analysis
22 are done to demonstrate that all the information
23 and safety of the plants that have been claimed,
24 they have to be demonstrated through this process.

25 Through that process,

1 commissioning would start and then they would apply
2 for a licence to operate to allow further
3 commissioning and the plant to go into service.

4 And this is done under the *Nuclear*
5 *Safety and Control Act*, which has many regulations
6 to which the Proponents would have to adhere.

7 And under that, we have detailed
8 regulatory requirements. And the one document we
9 talk about is RD-337, which is design requirements
10 for new NPPs. And Dr. Newland has discussed that
11 that document exceeds international requirements
12 for nuclear requirements.

13 But what we've also done is pre-
14 project design reviews, or started them or done
15 some depending on the designs.

16 And I'll ask him to outline what
17 we've done so far.

18 DR. NEWLAND: Dave Newland, for
19 the record.

20 The three designs -- four designs;
21 AECL EC-6 and AECL-1000, the Westinghouse AP-1000
22 and the AREVA EPR, are all relatively new
23 technologies in some ways, but they do build on
24 proven concepts.

25 We have done reviews of, in

1 particular, the EC-6, ACL-1000 and Westinghouse AP-
2 1000 designs as part of our pre-project plan to
3 review design assessments.

4 And as part of those reviews, what
5 we have discovered is that, to a large extent,
6 they're based on proven concepts to a large degree,
7 with the caveat that there are -- they do introduce
8 some what we would consider to be new features.

9 Now, within RD-337 -- and we use
10 337 as a basis for doing those reviews -- what we
11 do have is a requirement that if there is a new
12 feature or a novel feature that it is either based
13 on some proven past practice or it is an applicant
14 or a vendor must bring further data to the fore to
15 support that technology or that particular aspect.

16 And so that there are provisions
17 within 337 to ensure that there is -- the concepts
18 are proven.

19 MEMBER BEAUDET: Thank you.

20 Thank you, Mr. Chairman.

21 CHAIRMAN GRAHAM: Thank you,
22 Madame Beaudet.

23 Just a question I have to OPG, and
24 I know you've explained it before, but for
25 clarification would you -- it is mentioned that the

1 2005 OPA claim that it would cost 6 billion to
2 build 2,000 megawatts and now that has grown to 26
3 billion for 2,400 megawatts.

4 I think you clarified that a while
5 ago, but would you like to clarify what the new
6 build would cost at Darlington, not the refurb at
7 Darlington or not Pickering, but what the units
8 would cost to build at -- what's the estimated cost
9 at Darlington?

10 MR. SWEETNAM: Albert Sweetnam,
11 for the record.

12 At present, there is no estimated
13 cost for the units at Darlington. The reason for
14 this is that no vendor has been selected and no
15 technology has been selected.

16 However, the Assistant Deputy
17 Minister, when he was here, indicated that the
18 province is looking at a price range in between
19 \$5,000 and \$8,000 per kilowatt hour, and that's the
20 range that is presently being utilized.

21 CHAIRMAN GRAHAM: Thank you.

22 I will now go to OPG.

23 Do you have any questions or
24 comments with regard to this intervention?

25 MR. SWEETNAM: No questions.

1 Albert Sweetnam, for the record.
2 No questions. Just a follow-up to what I just said
3 to your question.

4 On the 26 billion, this is an
5 amount that was stated in the newspapers. It's not
6 based in fact, and it was refuted by the
7 procurement agency for the province, which is
8 Infrastructure Ontario.

9 And that was refuted on the
10 record, in writing, that the papers that had made
11 the statement about the 26 billion.

12 CHAIRMAN GRAHAM: Thank you.

13 CNSC, do you have any questions or
14 comments?

15 DR. THOMPSON: Patsy Thompson.

16 No, thank you, we don't have any
17 questions.

18 CHAIRMAN GRAHAM: Government
19 organizations, which I see none. Questions?

20 We have two people that want to
21 have questions from the floor. Gail Cockburn.

22 Ms. Cockburn, take the mic,
23 please.

24 --- QUESTIONS BY THE PUBLIC:

25 MS. COCKBURN: Chairman, I have a

1 question to you.

2 I just needed a clarification, and
3 I guess the question would be, when we hear that
4 beyond any doubt there's an association between the
5 incidence of child leukemia and cancer of various
6 types within a population where a study has been
7 interpreted, which I spoke briefly about, what is
8 the significance of that evidence when it is then -
9 - I guess my understanding was that it wasn't
10 statistically significant and I guess I don't know
11 if that's a matter of interpretation between one
12 person who has interpreted it in a study and
13 somebody else, and I guess I need a clarification
14 on that.

15 CHAIRPERSON GRAHAM: Thank you
16 very much.

17 Dr. Thompson, would you like to
18 clarify the question and respond, please?

19 DR. THOMPSON: Patsy Thompson, for
20 the record.

21 I would say that it's not a matter
22 of personal interpretation between -- different
23 interpretations between different scientists.

24 All of the studies are looked at
25 and considered by a number of scientists who do

1 this on a day-to-day basis and come together as
2 international committees to make sure that all of
3 the scientific information is reviewed and taken
4 into consideration in setting standards, and that
5 the standards are reviewed and revised as needed.

6 The question is more in terms of
7 the statistical significance of the studies, and
8 for that I would ask Ms. Lane to explain how the
9 studies are interpreted in terms of significance.
10 I think that would allow the intervenor to
11 understand better.

12 CHAIRPERSON GRAHAM: Ms. Lane?

13 MS. LANE: Rachel Lane, for the
14 record.

15 All right. The studies that we
16 are referring to are descriptive ecological
17 studies, all right, so they look at the rates of
18 disease within one area compared to the general
19 population of Ontario or Canada.

20 So what they're trying to do is to
21 see if one area's rate of disease for a population,
22 not individuals, is different than the general
23 population which is what considered the standard --
24 the standard population, okay?

25 What we're trying to do is see

1 whether the rate around nuclear power plants is
2 higher or lower than what would be expected in the
3 general population.

4 Now, when we talk about
5 "statistically significance" what you're trying to
6 do is to say is that rate -- and there's natural
7 variation in disease and we'll see that when I'll
8 provide the undertaking to you that there are some
9 high rates and some low rates of disease and that's
10 just natural.

11 What we're trying to detect is
12 whether or not the rate of disease in the area
13 around the nuclear facility is such that it is
14 different beyond that natural variation compared to
15 the general population. And that's what we refer
16 to as "statistically significance".

17 We have a -- the statistical --
18 we're getting statistical here but there's
19 basically -- we look at a 95 percent confidence
20 interval that whether or not the rate of disease is
21 95 percent confident that it is different or is not
22 different than the general population.

23 So that's why statistically
24 significance is so important because, yes, you'll
25 have high and low rates but it's well within the

1 conception exposure within, I think it was six
2 months of conception and childhood leukaemia.

3 So that was the way that we
4 followed it up. I hope that explains it.

5 CHAIRPERSON GRAHAM: Thank you.
6 Thank you very much.

7 Mr. Kalevar?

8 MR. KALEVAR: Mr. Chairman,
9 through you.

10 We have heard from geologists and
11 seismologists of low probability of earthquakes
12 with a -- high on Richter scale.

13 I haven't heard yet from any
14 professional that they're capable of future-
15 proofing our future, and we don't have a crystal
16 ball, in short.

17 And the question remains that
18 though we don't have a major fault here, we are
19 quite capable of being surprised by Mother Earth or
20 planet earth by quite high Richter scale
21 earthquake.

22 CHAIRPERSON GRAHAM: Could you put
23 your question, please?

24 MR. KALEVAR: Yeah.

25 Well, the question is, if this is

1 possible then it is quite likely that Lake Ontario
2 sweet water could be our tsunami and all of our
3 drinking water may not be easy to swallow once it
4 is radioactive.

5 So the question is to anybody, can
6 you make sure that -- give a high limit for -- some
7 limit for the size of the earthquake that we can
8 get? I don't think anybody can, but let's see if
9 anybody has that courage.

10 CHAIRPERSON GRAHAM: On Tuesday
11 last, which was Tuesday afternoon I believe,
12 seismologists and people from Natural Resources
13 Canada were here and presented.

14 They presented the historic data,
15 they presented the maps, they presented the
16 earthquake concentration, they submitted all of the
17 different aspects, and I believe your question was
18 answered.

19 You're questioning their ability
20 and I think that that answer -- that question has
21 been answered. Thank you very much.

22 And they did do future -- they did
23 do future projections and did answer questions from
24 the panel with regard to the future.

25 With that, I want to thank Ms.

1 Hawkins for coming today. I want to thank you for
2 your information you've provided, and certainly all
3 interventions written and verbal that are given
4 here are formulate part of the decision-making
5 which we've got a job to do in the future.

6 Thank you very much for coming.

7 MS. HAWKINS: Thank you.

8 CHAIRPERSON GRAHAM: With that,
9 I'm going to declare a 15-minute break, and the
10 Chair will resume at 3:25.

11 Thank you very much.

12 --- Upon recessing at 3:09 p.m. /

13 L'audience est suspendue à 13h09

14 --- Upon resuming at 3:26 p.m. /

15 L'audience est reprise à 13h26

16 CHAIRPERSON GRAHAM: In the
17 fairness of time, I think we should start.

18 I will now move to an oral
19 statement by Ontario's Sustainable Energy
20 Association.

21 And following that oral statement,
22 only panel members are permitted to ask questions.

23 And today that oral statement is
24 being made by Mr. Chopik. I believe that's right
25 or hopefully I pronounced that right. And, sir,

1 the floor is yours.

2 --- PRESENTATION BY MR. CHOPIK:

3 MR. CHOPIK: Thank you very much,
4 Mr. Chair, and good morning members of the panel.

5 My name is Chris Chopik. I am a
6 father, a businessman, and a constituent, and I'm
7 here today representing the Ontario Sustainable
8 Energy Association and its members, which include
9 Ontario communities, Ontario individuals and
10 renewable energy industries including biomass,
11 biogas, micro hydro, wind and solar.

12 The Ontario Sustainable
13 Association recommends that the Ontario Power
14 Generation proposal to build additional nuclear
15 reactors at the Darlington station be rejected and
16 not permitted to proceed. Our premise for
17 rejecting them stem from three key areas of
18 concern.

19 First, alternative solutions to
20 energy demand, including more affordable solutions
21 such as aggressive conservation, have not been made
22 -- been offered for consideration as alternatives
23 for the 10 percent demand that's -- that's looking
24 to grow.

25 A true -- secondly, a true and

1 complete cost of building and operating an
2 additional reactor should be made available for a
3 transparent public review.

4 This, like any good business plan,
5 should include all reasonable and foreseeable
6 costs, including refurbishment and retirement
7 costs, waste storage, insurance for liability
8 particularly, and potential public health risk.

9 Thirdly, nuclear waste is an
10 environmental human health and economic threat to
11 Canadian society and future generations for
12 millions of years.

13 The current federal *Limitation of*
14 *Liability Act* limits the financial risk of a
15 nuclear operator in Ontario to \$75 million. This
16 inadequately protects Ontario ratepayers from cost
17 overruns and costly hazards to personal property,
18 health and the environment.

19 And at this point, we should be
20 evaluating all infrastructure projects against a
21 triple bottom line full-cost model, including
22 nuclear power. This is a simple business
23 imperative for sensible investment in the global
24 marketplace of financial and ecological insecurity.

25 I'll go into more detail on -- on

1 these three points now.

2 So regarding the -- the fact that
3 no alternative solutions to energy demands have
4 been considered or proposed, there has been no
5 presentation of alternatives to the project in
6 order to justify the continuation of building
7 additional nuclear reactors.

8 There has not been a public
9 assessment of the need for the project to be
10 conducted. Energy demands across the province can
11 be met by many forms of sustainable energy that are
12 more cost efficient than nuclear reactors and more
13 socially responsible.

14 Because of the great amount of
15 financial policy and infrastructure support needed
16 for new developments, Ontario will be locked into
17 nuclear reliance for decades.

18 This project would deny Ontario
19 the future to develop more sustainable energy
20 options such as wind, solar, geothermal, micro
21 hydro and biomass.

22 Continuing plans to refurbish and
23 build new nuclear generation units will not only
24 cause an inflexible baseload supply, but it will
25 also eliminate the integration of renewables into

1 the grid as a result of capacity load.

2 Also, any public investment in
3 inexpensive -- in expensive nuclear power will mean
4 less funding to develop and deploy renewable
5 energy.

6 Already thousands of communities
7 and individuals in Ontario are taking advantage of
8 these resources that the earth gives us for free.

9 They are producing energy locally
10 with wind turbines and solar panels and are
11 generating revenue for their communities from their
12 projects. Please do not let nuclear prevent future
13 renewable energy growth here in Ontario and allow
14 us to continue to grow our leadership role in green
15 energy.

16 At a low price of three cents per
17 kilowatt hour, aggressive conservation is the
18 cheapest and most sensible path to creating new
19 supply in Ontario.

20 The Canadian Green Building
21 Council declares that 50 percent energy
22 conservation is available through retrofit of
23 existing buildings.

24 With these significant numbers,
25 OSEA believes that conservation and sustainable

1 energies can account for the 10 percent energy
2 demand being proposed to be filled by the new
3 nuclear facility at Darlington.

4 Conservation and renewables offer
5 an affordable full-cost solution that can
6 predictably come on line in a timely way and in a
7 -- in a predictable budget without public risk.

8 The true cost of building --
9 secondly, the true cost of building and operating
10 an additional reactor are not transparent.

11 As evidenced in our conversation
12 this morning, the costs of the project are not
13 transparent. We do not know what they are or what
14 they're likely to be -- no projections.

15 And before any approvals can be
16 made for this project, socially responsible -- and
17 we must account for all costs of nuclear energy
18 production, waste and storage of the waste. The
19 parameters that -- that you've set include --
20 exclude important considerations such as conducting
21 an economic assessment.

22 As I stated earlier, renewables
23 and conservation have lower economic costs and more
24 benefits to the community.

25 A study by Moody's Investor

1 Services indicates that nuclear is more expensive
2 than wind energy. It also notes that there are
3 considerable negative pressures on the economics of
4 nuclear plants.

5 The costs keep increasing because
6 of security and long-term waste disposal
7 uncertainties. Nuclear energy has a history of
8 cost overruns. The risk and burden of these costs
9 should be fully kept on the developer.

10 OSEA is calling for transparency
11 on the price of nuclear energy. If feed and tariff
12 market mechanisms were applied to nuclear energy,
13 it would indeed reveal the true cost of nuclear to
14 the consumer.

15 All procurement processes for
16 energy should be transparent and incorporate a full
17 life cycle cost of the benefits of the proposed
18 generation.

19 Contracts should likewise be
20 transparent and must not allow proponents to impose
21 cost overruns on the rate and tax base as has been
22 done in the past and -- with non-renewable energy.

23 Currently, only renewable power
24 generation procurement is transparent and with
25 proponents covering the full -- the -- covering the

1 full burden of cost overruns; that is, we self-
2 insure.

3 We insure our projects and we
4 assume all risk not carried by the -- by the
5 ratepayer. The same standard should be expected of
6 all types of generation.

7 Finally, on the issue of nuclear
8 waste and environmental human health and economic
9 threat to Canadian society and the future
10 generations for millions of years, the dangers and
11 risks that go along with nuclear energy are far too
12 great to go ahead with the technology. Technology
13 cannot solve the waste problem.

14 If methods of disposing for
15 radioactive waste fail, the damage is -- is
16 appreciable and -- and irreversible. Our
17 continuing investment in new developments with this
18 technology are putting in danger entire life cycles
19 and risking contamination of the groundwater over
20 large areas of the -- of the earth's surface.

21 The risk of ecological disaster
22 should be weighed against the benefits that will be
23 received by society if the nuclear future is
24 realized especially when it is not our own option
25 -- our only option.

1 Dangerous and toxic radioactive
2 waste produced by this new reactor at Darlington
3 will remain in the earth for millions of years.
4 It's really -- is this really the -- the future
5 that we ultimately want to hand to our kids?

6 Climate change is a
7 scientifically-proven fact that needs to be
8 addressed immediately. Ontario is moving in the
9 right direction by eliminating carbon emissions
10 from coal, but nuclear is not the best solution.

11 Nuclear reactors take about 10
12 years to get online compared to a wind turbine that
13 only takes a few years. Wind power merits greater
14 public investment than nuclear does and nuclear is
15 not a panacea for climate change, but rather it
16 delays the implementation of real and proven
17 solutions.

18 Germany has implemented a three-
19 month moratorium on nuclear energy and we're asking
20 you to consider doing the same. At a panel -- as a
21 panel member, you have the opportunity to do the
22 same in Ontario by refusing to build additional
23 reactors and instead increasing Ontario's portfolio
24 of clean, renewable and sustainable energy.

25 Continued vigour and freeing

1 existing capacity through conservation, which we
2 want to underscore, and improving the output from
3 existing nuclear -- because there is capacity
4 that's not being used there.

5 In conclusion, these hearings
6 should explore the options that Ontario has to meet
7 the energy demand rather than prescribing nuclear.

8 The unaccounted for issues of
9 transparency and political interference discredits
10 the social credibility of the project and must be
11 addressed before any approval is made.

12 There are no guarantees of its
13 safety and immense consequences to the environment
14 if the technology fails or an unpredicted disaster
15 should occur.

16 Ontario needs -- needs to
17 accelerate transition to renewables and reduce its
18 energy consumption through the implementation of a
19 smart grid, using energy storage technologies that
20 are only improving with time rather than continuing
21 with dangerous, expensive technologies that leave a
22 mess for our great-grandchildren to clean up.

23 In closing, OSEA requests that you
24 consider the importance of transparent public
25 review against a triple bottom-line, full-cost

1 model that ultimately protects Ontario's ratepayer
2 from cost overruns and costly hazards. Thank you.

3 CHAIRPERSON GRAHAM: Thank you
4 very much. As you -- as I've mentioned the rules
5 go with only members from the Panel. And I'll go
6 to Madam Beaudet.

7 --- QUESTIONS BY THE PANEL:

8 MEMBER BEAUDET: Thank you, Mr.
9 Chairman.

10 You said that you work -- or your
11 association looks at biogas. Do you have here in
12 Ontario huge landfill sites that you can collect on
13 an industrial level biogas and use it for
14 electricity?

15 MR. CHOPIK: I believe that
16 capacity exists. I am an individual member of
17 OSEA. I don't represent -- I'm not a power
18 producer per se, but, yes, the capacity exists.

19 The real opportunity from a
20 climate change perspective is that those sites, as
21 well as smaller sites are -- have methane going
22 into the atmosphere, which is more damaging as a
23 greenhouse gas than carbon dioxide.

24 And it's also a harnessable energy
25 source, so part of that is -- is distributed

1 biogas, so large-scale farming operations, track
2 raceways and those kinds of folks that have a lot
3 of manure and other -- other issues to manage, can
4 then take the waste, use the electricity and
5 generate that profitably through the Feed-In Tariff
6 Program.

7 MEMBER BEAUDET: Thank you.

8 I would like to address a question
9 to CNSC regarding their regulatory standard. S296,
10 a title for the record, "Environmental Protection
11 Policies Programs & Procedures at Class 1 Nuclear
12 Facilities and Uranium Mines and Mills".

13 And in the glossary there is a
14 definition of environment and a definition of
15 environmental effect. I think these definitions are
16 based -- there is a footnote anyway. They are based
17 on -- probably on the *Canadian Environmental Impact*
18 *Act -- Canadian Environmental Protection Act*.

19 Correct me if I'm wrong, but what
20 we see here is that the definition of environment is
21 based mainly on biophysical aspects. And the social
22 economy aspects, health, et cetera, looked at -- not
23 in terms of the environment of the people, but in
24 terms of environmental effect.

25 There has been a decision in 1992

1 by the Supreme Court. I'm sure you've heard of it.
2 The Friends of the Old Man River Society, which
3 clearly indicated that the definition of environment
4 should be broader and include also the social and
5 cultural environment, not in terms of effect, but in
6 terms of definition.

7 And here what I -- we can
8 interpret is a lot of the intervention have based
9 very much on value and fairness principles,
10 sustainable development, et cetera.

11 And this is not -- it's not an
12 effect. It's -- you can call it the value of
13 environment of a society. And I was wondering if
14 there has been any discussion to recognize the
15 Supreme Court decision, and any process would
16 change, you know, your standards by integrating a
17 different definition of environment?

18 CHAIRPERSON GRAHAM: I think
19 that's directed to CNSC?

20 DR. THOMPSON: Patsy Thompson, for
21 the record.

22 The regulatory document you
23 referenced, S296, was developed when the *Nuclear*
24 *Safety and Control Act* came into force to provide
25 guidance and expectations for environmental

1 protection programs and policies because this was a
2 new requirement and many licencees were wondering
3 what we meant by this requirement.

4 And so the S96 is essentially a
5 line to the ISO 14.001 standard, but
6 goes -- has added elements that cover requirements
7 under the *Nuclear Safety and Control Act* and
8 *Regulations* that are not found in ISO 14.001, so
9 it's essentially ISO 14.001 plus a few elements to
10 make sure that all the requirements of the -- of the
11 *Act and Regulations* are covered.

12 We used at the time definition of
13 environment -- excuse me, environmental effect
14 because the *Nuclear Safety and Control Act* provides
15 for the protection of health safety and environment.

16 And in Canadian legislation it
17 seemed to be at the time the definition that was
18 taken from the *Canadian Environmental Assessment Act*
19 that best aligned with the requirements of the NSCA.

20 And so we did talk about effects
21 of the environment from a biophysical point of view,
22 but in terms of health, it's essentially, effects of
23 projects or facilities that are licenced on human
24 health from, you know, a traditional health
25 consideration perspective. And that's essentially

1 because that aligns with the requirements of the
2 *Nuclear Safety and Control Act*.

3 In terms of consideration of the
4 1992 Supreme Court decision, I am not sure what
5 process is in place within the Federal Government to
6 consider the outcome of the -- of the Supreme Court
7 decision.

8 I do know that the revisions to
9 the *Canadian Environmental Assessment Act* in 2003
10 have not changed significantly from previous
11 definitions. And similarly the definition
12 of environment in the *Canadian Environmental*
13 *Protection Act* is similar in terms of definition.

14 MEMBER BEAUDET: Yes, I agree. I
15 say that from the start that it's very similar and I
16 think this regulation here I have is March 2006 and
17 with the -- with CEAA, the revision, as you say, is
18 2003. Some provinces have made the adjustment.

19 And we have many interventions
20 that consider the ethical aspects of the project or
21 management of waste.

22 And I was -- I just wanted to know
23 if there was an effort within, you know, the CNSC to
24 follow up on court decisions because other higher
25 courts have made also the same recommendation as the

1 Supreme Court? And the answer I guess is no.

2 DR. THOMPSON: Patsy Thompson, for
3 the record.

4 The regulatory documents within
5 the CNSC regulatory framework are to provide
6 expectations for meeting the requirements of the *Act*
7 *and Regulations*.

8 They're not -- they were not
9 appropriate -- it would not be appropriate for
10 regulatory documents to add to the requirements of
11 the *Act and Regulations*.

12 And I suspect that to be able to
13 consider the ethical aspects or the values and
14 fairness principles, the *Nuclear Safety and Control*
15 *Act* would need to be amended because the -- clearly
16 the mandate that the Federal Government has given to
17 the CNSC is to regulate in order to protect health
18 safety and the environment, but in terms of
19 potential impacts from the licenced activity in a
20 more traditional sense.

21 MEMBER BEAUDET: Thank you. Thank
22 you, Mr. Chairman.

23 CHAIRPERSON GRAHAM: Thank you,
24 Madam Beaudet.

25 Mr. Pereira?

1 MEMBER PEREIRA: Thank you, Mr.
2 Chairman.

3 Thank you for your presentation
4 and particularly for your discussion on alternatives
5 and the green options that you spoke about.

6 We did have a presentation from
7 the Assistant Deputy Minister of Energy from Ontario
8 earlier in our hearings, and he spoke about the
9 decisions that have been made by Ontario on the mix,
10 the supply mix with nuclear and conservation and,
11 you know, green options.

12 And there were some consultations
13 that he spoke about that Ontario engaged in to get
14 input from interested parties, and all of that, I
15 believe, went into the decision that Ontario reached
16 on the mix of energy supply options.

17 So from that, then, Ontario
18 decided to request Ontario Power Generation to come
19 forward at an application to build new nuclear
20 generating stations or new reactors at Darlington
21 Generating Station.

22 And what this panel is doing is
23 looking at the environmental impact of that
24 application to build new nuclear generating
25 stations.

1 So the decisions on energy mix and
2 the alternatives and, you know, commitment to more
3 conservation and so on, have already been taken by
4 the province of Ontario, and the consultations on
5 that have been completed.

6 And if you go back and look at our
7 transcripts, you'll see the explanation given by
8 the Assistant Deputy Minister on what went with
9 that decision, and there's a lot of information,
10 interesting information to be presented there, and
11 there were questions on costing and so on that --
12 that were asked by intervenors during that
13 particular presentation.

14 So that's -- that's just the
15 background that, you know, we -- we are further
16 down the process than I think maybe you think we
17 are. But anyway, I'll just offer that back to you
18 as feedback.

19 MR. CHOPIK: I appreciate that and
20 I think the great question that we have is, why is
21 it that -- that this is not an open business plan
22 where ratepayers can evaluate the total cost, that
23 we do have exposure to, let's say, some
24 accountability of environmental risk.

25 It's one thing to say that studies

1 on an innocuous, undisturbed, perfectly functioning
2 power generating facility are not harmful to the
3 public, but what is the cost of risk? And I -- you
4 know, I put this on myself.

5 I personally drive with a two
6 million liability insurance on my car. Then, you
7 know, the worst case scenario, I hit a couple other
8 cars and kill a few people, and then that's what
9 that's there to protect my family from, assuming
10 that I'm not alive at that point.

11 You know, we're talking about 35
12 times that coverage for this nuclear facility. And
13 the rest of the liability bag sits in the public
14 domain.

15 Is that piece of environmental
16 accountability or environmental risk factored into
17 your process, and if so, how?

18 MEMBER PEREIRA: Well, what we
19 would be doing is carrying out a review of the
20 environmental impact statement provided by Ontario
21 Power Generation, and writing recommendations on
22 what should be done to mitigate the risks and to --
23 for what follow-up action is required, and that
24 would be presented in the commendation to the
25 federal minister.

1 And once that is -- the report is
2 either accepted or rejected, but going forward from
3 there, then it's a decision on the part of Ontario
4 Power Generation to take that forward.

5 And perhaps I'll ask Mr. Sweetnam
6 to comment on that further.

7 MR. SWEETNAM: Albert Sweetnam,
8 for the record.

9 First of all, I'd like to
10 apologize to the Chair and the panel for arriving
11 slightly late. We got tied up with one of the
12 undertakings and didn't notice the time.

13 CHAIRPERSON GRAHAM: That's quite
14 all right, we understood. We -- we started without
15 you, but you got here as quick as possible. Go
16 ahead.

17 MR. SWEETNAM: The intervenor has
18 several times basically said that -- that the costs
19 are not reviewed publically. It's not a public
20 process, and there was some concern about that.

21 OPG is the lowest cost electricity
22 generator in Ontario. Our prices are set by the
23 Ontario Energy Board, and this is done by a public
24 transparent process, which actually just finished,
25 and the ruling of the OEB came out a couple weeks

1 ago.

2 So in addition to setting the
3 prices, the OEB also does a public transparent
4 review of all costs, and all of our costs undergo a
5 prudence test, and if they're not prudent, they're
6 not put into the rate base. And we are the only --
7 we are the only utility -- nuclear utility that
8 actually undergoes this in Canada.

9 So the Ontario system is very
10 public, very transparent and anybody that wants to
11 have an input into these hearings, that the OEB can
12 do this, and our rates still remain the lowest
13 rates in Ontario in terms of generation.

14 MEMBER PEREIRA: Thank you, Mr.
15 Chairman and Mr. Sweetnam.

16 CHAIRPERSON GRAHAM: With that, I
17 want to thank Mr. Chopik for coming today, giving
18 his ten-minute presentation, and thank you very
19 much for coming and contributing to these hearings
20 in the way you have.

21 MR. CHOPIK: Thank you, Chairman
22 and panellists.

23 CHAIRPERSON GRAHAM: We will now
24 proceed to the last -- last presenter of the day,
25 the next intervenor, and that is the Canadian

1 Nuclear Association, and can be found on PMD 11-
2 P1.172 and PMD 11-P1.172A. And I believe it's Ms.
3 Denise Carpenter. Ms. Carpenter, welcome to you
4 and your other people joining you today.

5 (SHORT PAUSE/COURTE PAUSE)

6 --- PRESENTATION BY MS. CARPENTER:

7 MS. CARPENTER: Thank you. Good
8 afternoon, Mr. Chairman and panel members.

9 Before I start, I'd like to
10 introduce you to my colleagues. On my left I have
11 Ms. Kathleen Olson, our Director of Communications;
12 on my right, Ms. Heather Kleb who is our Director
13 of Regulatory Affairs, an Environmental Scientist
14 and a biologist. And as you know, my name is
15 Denise Carpenter and I am the CEO of the Canadian
16 Nuclear Association.

17 Before we proceed in making our
18 submission on the Darlington New Nuclear Power
19 Plant I'd like to start by saying that on behalf of
20 the 71,000 people who work in Canada's nuclear
21 industry, from our workers at our TRIUMF Nuclear
22 Research facility in British Columbia, from the
23 SLOWPOKE reactors at the University of Alberta,
24 from Cameco and AREVA uranium mining operations,
25 the Saskatchewan Research Council and all our power

1 plant workers and researchers in Ontario, Quebec
2 and New Brunswick, we commend the people of Japan
3 who have shown amazing resilience and fortitude
4 since the devastating earthquake and tsunami three
5 weeks ago.

6 The resources and the spirit of
7 the Japanese people were and will continue to be
8 tested in the weeks and months ahead. They are
9 facing the present challenges with solidarity and
10 courage.

11 And as an industry, we are proud
12 of our safety record but we are never complacent.
13 The tragedy in Japan will, of course, be examined
14 thoroughly for lessons we can apply to safety here
15 in Canada.

16 Our industry has a culture of
17 cooperation and openness that transcends national
18 boundaries and commercial interests in a way that
19 is unique amongst industries worldwide.

20 We consider an event at any
21 nuclear plant to be an event at every plant. As an
22 industry, we've come together to share ideas,
23 review our own plants, consider lessons learned
24 from the tragic events in Japan.

25 Our members are actively

1 responding to the CNSC request for action, as well
2 as to other reviews required, and all information
3 will be submitted as requested by April 29th.

4 Reviewing our industry's safety
5 regulations is an iterative process and something
6 we do on a routine basis.

7 In fact, Darlington has already
8 been made -- made industrial history by becoming
9 the first nuclear station in North America to be
10 certified under the tough ISO 14001 Environmental
11 Standard.

12 This process of continuous
13 improvement will and must go on, and nuclear plants
14 will continue to be better and safer.

15 Since March 11th events in Japan,
16 many have questioned the safety of Canada's nuclear
17 industry. Let me start by saying, well, there are
18 no -- there is no such thing as absolute safety.
19 Canadians and Canada's fleet of reactors are safe.

20 You've heard about the seismic
21 activity in the Durham Region is low and similar to
22 most of eastern North America. The station is
23 designated to withstand any anticipated activity.

24 Safety has always been and
25 continues to be the number one priority for our

1 industry. The nuclear safety culture goes beyond
2 geographical boundaries. It's truly global.

3 I'll talk a little more about
4 safety but I want to take a moment and tell you a
5 little bit about who the Canadian Nuclear
6 Association is.

7 Our association represents 71,000
8 Canadians that are part of Canada's nuclear
9 community. Our members include uranium mining and
10 processing companies, manufacturers, engineering
11 firms, power utilities, labour unions, universities
12 and associations across Canada.

13 Nuclear generates approximately 15
14 percent of the electricity in Canada, and as you
15 know, over 55 percent of Ontario's total
16 electricity.

17 And I'm proud to say that our
18 industry has an exemplary track record on safety,
19 over 45 years of occupational and public health and
20 safety. But today, I'm here to talk about an
21 exciting project, the Darlington New Nuclear Power
22 Plant.

23 As stated in the CNA's written
24 intervention, we recognize that the Joint Review
25 Panel has a sizeable task ahead of you. However,

1 given OPG's considerable operating experience and
2 the favourable environmental impact statement
3 findings, the CNA believes that OPG should be
4 granted a favourable environmental assessment
5 decision and a licence to prepare the future site
6 of the Darlington project.

7 We see this project as an
8 opportunity and as an important step in fulfilling
9 Canada's growing energy demands. It's an integral
10 part of the province's plan to maintain its base
11 load nuclear generation capacity and is also
12 essential to the maintenance of Canada's
13 electricity supply.

14 Today I'll touch on some very
15 important topics as they relate both to the
16 Darlington project and to our industry as a whole.
17 They include the economic benefits of the project,
18 environmental effects of the project and their
19 mitigation and safety considerations and safety in
20 our industry as a whole.

21 And before I begin I want to say
22 that our industry is truly a global community and
23 no one knows this better than the citizens here of
24 Clarington, home of these generating facilities and
25 proposed new plant.

1 OPG's Darlington Nuclear
2 Generation Station has been part of this community
3 for over 25 years. Even 25 years ago, the
4 community of Clarington possessed a vision, a
5 vision to work with the industry. It recognized
6 the opportunities for jobs, prosperity and growth
7 and great opportunity for their children, and it
8 seized it.

9 Clarington is an example of what
10 communities can accomplish all over Canada and,
11 indeed, the world when it comes to energy
12 development.

13 OPG has been a critical partner in
14 this vision and it has maintained a trust and a
15 respect of the Clarington community through its
16 actions, discipline, safety regime and it's
17 commitment to the community. I think it's fair to
18 say that past performance is the best indicator of
19 future potential

20 OPG has a strong track record. It
21 has operational experience and talent and proven
22 systems to lead the Darlington project to success.
23 One of the objectives of the *Canadian Environmental*
24 *Assessment Act* is to:

25 "Encourage responsible

1 authorities to take actions
2 that promote sustainable
3 development and thereby
4 achieve or maintain a healthy
5 environment and a healthy
6 economy."

7 The Darlington project certainly
8 does this.

9 But the most important factor in
10 all of -- in all major decisions is the outcome.
11 If the outcome is to be successful, it has to be
12 people and community, and what is the best decision
13 -- the right decision for our communities today and
14 in the future.

15 To me, community is first and
16 foremost about people. It's about reaching out to
17 your neighbours, whether you're at home, at work or
18 at the shopping centre. It's about the human
19 connection.

20 The Darlington project is more
21 than a construction project. It's about our
22 nuclear industry and how we're playing a critical
23 role in keeping our communities economically
24 vibrant, environmentally sound and healthy.

25 With respect to social-economic

1 effects there is a defined need to ensure that
2 Canada will maintain its base of highly-skilled
3 professionals and sustain its advantage in science
4 and technology innovation.

5 As Canada and the world emerge
6 from this economic downturn, the nuclear industry
7 is helping to sustain and create high-paying,
8 highly-skilled jobs.

9 In fact, Canada's nuclear industry
10 is already a \$6.6 billion industry. Every year we
11 generate \$1.5 billion dollars in federal and
12 provincial taxes and provide rewarding careers for
13 71,000 Canadians.

14 In a recent report by the Canadian
15 Manufacturers and Exporters, they showed that just
16 two projects alone, the refurbishment of the
17 nuclear facilities at Bruce and Darlington will
18 support almost 25,000 jobs for a decade. It will
19 inject \$5 billion annually into the Ontario
20 economy.

21 The Darlington project alone has
22 the potential to employ 7,500 workers directly and
23 indirectly all across Ontario.

24 The increase in workers has the
25 potential to increase the spending associated with

1 the Darlington project, increasing the province's
2 gross domestic product by as much as \$1.4 billion.

3 The increase in GDP corresponds to
4 approximately a \$500 million increase in total
5 household income to the Province of Ontario.

6 Our sector is also doing its part
7 to maintain Canada's position as an export based
8 economy, given that our members generate annual
9 export sales of \$1.2 billion per year.

10 Nuclear energy is affordable.
11 After all, the cost of nuclear or the misleading
12 perceptions that the costs are just too high is
13 something we should now address because when all
14 costs are considered over the long term, Canadians
15 pay the same or less for electricity for nuclear
16 power compared to other forms of electricity.

17 According to a 2010 study
18 conducted by the OECD, the levelized cost of
19 electricity for nuclear is lower than most other
20 sources of electricity.

21 In short, nuclear energy is a 24-
22 hour base load power. It's affordable, it's
23 available and it's reliable in meeting growing
24 demands for electricity now and in the future.

25 One of, if not the most important,

1 resources we have is our environment. We, as an
2 industry, are committed to environmental
3 stewardship. Protecting the land, the air, the
4 water, both in the communities which we operate and
5 globally.

6 Many of the predicted effects, I
7 must say predicted effects, of the Darlington
8 projects are known and have therefore been pre-
9 empted though the application of OPG's proven
10 protection measures.

11 OPG is committed to aquatic and
12 environmental stewardship and has been recognized
13 for its past performance with several awards,
14 including the most prestigious William W. Howard
15 CEO award in 2009, which recognized their history
16 in excellence for conservation, education and
17 outreach.

18 Nuclear energy provides a clean
19 and reliable source of power and is an important
20 part of Canada's clean energy portfolio.

21 Throughout construction potential
22 determinants to air quality will be largely avoided
23 by using standardized protection measures used by
24 the construction industry. Putting our values into
25 action at all stages of our industry is something

1 we are committed to doing. Quite simply it's the
2 right thing to do.

3 As Canada and the global community
4 work to address the challenges of climate change,
5 nuclear energy is an important part of Canada's
6 clean energy portfolio. That's because nuclear
7 power plants emit virtually no greenhouse gasses as
8 a result of their operations.

9 There is a carbon footprint, but
10 it's a very small one, and it stems from the energy
11 consumed when the facilities are being constructed.
12 This fact has been verified by the Canadian Energy
13 Research Institute. It analyzed greenhouse gas
14 emissions from various power generation sources,
15 and concluded that energy generated from nuclear
16 power plants resulted in emission levels that are
17 now lower than coal, oil and natural gas.

18 In fact, the emissions profile of
19 nuclear energy is similar to wind, solar and hydro.

20 Replacing fossil based energy with
21 nuclear energy can have a very positive effect as
22 we strive to lessen our country's carbon footprint.

23 Now, I've already talked about the
24 safety of our industry, but I want to reiterate
25 that Canada has an exemplary nuclear track record,

1 with over 45 years of occupational and public
2 health and safety.

3 The Canadian Nuclear Safety
4 Commission, the federal agency that regulates the
5 use of nuclear energy materials, does this to
6 protect the health, safety and security of
7 Canadians and the environment.

8 CNSC staff are actually located on
9 the sites of each of our facilities all across
10 Canada to ensure that materials are safe and that
11 the facility operators are prepared in the event of
12 an emergency.

13 Nuclear operators and personnel
14 are carefully selected, highly trained and
15 qualified, and then indeed certified again by the
16 CNSC.

17 Workers complete about 30
18 continuous training sessions over a five-year
19 period. This is quite vigorous stuff, and it
20 includes training and testing on simulators that
21 replicate what happens in a control room.

22 Simulations are carried out to
23 simulate operational conditions ranging from
24 normal, steady as it goes, to all out emergency
25 situations. This training ensures that the skills

1 of our workers are up to date and it helps give
2 stakeholders the confidence that they require when
3 they live around our plants.

4 And our industry's activities are
5 also monitored by Environment Canada, Health
6 Canada, Fishery and Oceans Canada, Transport
7 Canada, and the International Atomic Energy Agency.

8 Beyond this there are many layers
9 of protection between Canadian nuclear operators
10 and their employees and the communities where we
11 operate. These layers ensure safety of our people,
12 our communities and our shared environment.

13 We take all of this very seriously
14 because we live in the communities, and our workers
15 live in the communities around these plants. Our
16 children go to schools around these plants.

17 So if you work or live near a
18 nuclear facility, you know, I could look you in the
19 eye and say with confidence that safety has always
20 been the upmost concern and the first priority of
21 these employees that work in the plants.

22 In fact, if you work or live near
23 this facility, you can probably talk to them and
24 learn a lot more about the safety than I or a lot
25 of these people who have been presenting to you,

1 and I encourage you to talk to the people who work
2 in these plants.

3 As for the Darlington project, the
4 environmental assessment results indicate that it
5 is, indeed, protective of the environment.
6 Environmental effects will be limited as a result
7 of OPG's more than 40 years of operational
8 experience and proven systems, and the potential
9 effects of construction will be limited through the
10 application of very well established protection
11 measures used by the construction industry today.

12 I'm a firm believer that the best
13 indicator of future performance is past
14 performance. OPG has a strong track record, and
15 I'm confident that they can lead the Darlington
16 project successfully.

17 It is true that the project is an
18 important step in fulfilling Canada's growing
19 energy demands. In fact, last November the
20 Government of Ontario committed to clean, reliable
21 nuclear power remaining at approximately 50 percent
22 of the province's electricity supply as part of
23 their long-term energy plan.

24 But nuclear is also important for
25 the communities. And as I discussed, the benefits

1 of this project will be felt in the municipality of
2 Clarington, but also across Ontario, and indeed
3 across Canada, and it will be a crucial step
4 forward in the growth of the community and of our
5 global community.

6 Canada's providers of nuclear
7 energy are committed to the environment, its
8 preservation and its future. We, along with the
9 global community, are continually striving to
10 improve safety, economics and environmental
11 performance.

12 And with that, I'd like to thank
13 you for giving us the opportunity to present here
14 today, and we're available to take questions as
15 well.

16 Thank you.

17 CHAIRPERSON GRAHAM: Thank you
18 very much, Ms. Carpenter.

19 And we will go direct to the panel
20 members, and Mr. Pereira, you're first.

21 --- QUESTIONS BY THE PANEL:

22 MEMBER PEREIRA: Thank you, Mr.
23 Chairman.

24 In one of your early slides you
25 included a bullet which said take actions that

1 promote sustainable development, and on your final
2 slide I think there's one reference to Pickering
3 and Darlington being a purported recognition of
4 signatures of sustainability.

5 Now, in our hearing many of the
6 intervenors have challenged us to regard
7 sustainability as a challenge when looking at the
8 whole cycle, from mining to waste management over
9 the long term.

10 What are your comments on that and
11 in particular the fact that there's got to be
12 stewardship of long-lived waste? How do you regard
13 that challenge in terms of from the sustainability
14 perspective?

15 MS. KLEB: Heather Kleb, for the
16 record.

17 I am pleased to speak to the
18 uranium mining sector, given that they're not
19 currently present. And what I would like to say is
20 that the uranium mining sector is a strong
21 performer when compared to other mining sectors
22 across Canada. And I think that some of the
23 strongest evidence of that has been presented in
24 recent annual reports issued by the CNSC on uranium
25 mining activities which indicate, and I quote:

1 "That the uranium mining
2 sector was once again the
3 best performing mining sector
4 relative to the metal mining
5 effluent regulation with no
6 exceedances in 2008-2009 and
7 so on."

8 So they're known to be strong
9 performers across the mining sector and in terms of
10 waste management they employ best practices, they
11 continually review their technologies to ensure
12 that they're using best available technology and
13 that their releases are as low as reasonably
14 achievable and they employ best practices accepted
15 across Canada within in the mining industry.

16 MEMBER PEREIRA: Thank you for
17 that front-end of the cycle review. How about the
18 back-end, the used fuel waste and the fact that we
19 need to be able to present that to the Canadian
20 public as being something as sustainable, the fact
21 that we've got to look after used fuel waste for a
22 very long time?

23 MS. CARPENTER: This industry is
24 one of the only industries that's required to
25 understand its full cycle of its product.

1 We track where the uranium comes
2 from, how it's used, how we dispose of it. In
3 fact, this industry actually knows where every bit
4 of uranium is or most of it in the entire fuel
5 cycle.

6 The next part that I think you're
7 alluding to is what happens with the waste? So in
8 Ontario right now we have the waste management
9 organization that has employed an adaptive waste
10 management process.

11 I must say the process has been
12 fulsome and very consultative across Canada to
13 determine the opportunity for a community to have a
14 waste facility in their community right now and
15 they have gone through an exhaustive process.

16 So again, the industry will
17 actually know where its waste is.

18 And obviously the hope and the
19 dream of all of us, you know, as human beings is
20 that we will be able to recycle that waste someday
21 and indeed in China that's being tested on some
22 CANDU reactors right now. Can we recycle that
23 waste, and it has been successful, the spent fuel
24 waste.

25 MEMBER PEREIRA: Thank you.

1 CHAIRPERSON GRAHAM: Thank you,
2 Mr. Pereira.

3 Madam Beaudet?

4 MEMBER BEAUDET: Thank you, Mr.
5 Chairman.

6 To go on on a related topic; you
7 said that you are trying to improve environmental
8 performance. I've asked this question already but
9 I'm asking it to you as well.

10 Do you have committees, do you
11 have lobbying with the government to get funds to
12 be committed to the research, to improve the
13 environmental performance of the field in terms of
14 emission and -- like tritium, we had lots of people
15 that came and are worried about tritium and waste?

16 Well waste, you've just given an
17 example, but how far is it going, how far is it
18 pushing, how successful are you?

19 MS. CARPENTER: I can speak for
20 the association and the work that we do and then
21 I'll ask Heather to speak specifically about some
22 of the work we're doing collaboratively as an
23 industry in the tritium area.

24 So certainly as an industry
25 association we have a responsibility to our members

1 and to society as a whole to work collaboratively
2 amongst ourselves.

3 So yes, we do have advisory
4 committees and working groups on a variety of
5 issues that affect our industry and we collaborate
6 and work and develop, either recommendations or
7 processes or do the appropriate research that is
8 required to work through some of those issues.

9 On your comment about research and
10 development, I can't help but take the opportunity
11 to say, you know, in Canada we are blessed with a
12 very rich research and development industry around
13 nuclear power and nuclear science and medicine and
14 it's not just about power. It's about helping
15 Canadians have healthy lives and it's about using
16 medical instruments to save lives every day and
17 medical technology that's driven from the R&D in
18 our industry. And that's a very important part of
19 our industry.

20 So yes, we do advocate on behalf
21 that, very vigorously and we believe that it's a
22 necessary part of Canada and our industrial
23 infrastructure to have that strong research and
24 development component.

25 CHAIRPERSON GRAHAM: Each time you

1 speak would you identify yourself because they need
2 it on the transcripts.

3 MS. KLEB: Heather Kleb, for the
4 record.

5 All that I would add to that is
6 that, yes, we have strong concerns and a strong
7 interest in how release limits are developed and
8 when we do have areas of concern like that we
9 coordinate our members and we set up working
10 groups, for example, where we can share information
11 and provide feedback to the regulators in terms of
12 how new regulatory limits could be developed.

13 And yeah, our ultimate goal is
14 compliance and if there's a way that we could
15 better comply or seek to comply we're quite willing
16 to provide that feedback and we work together to
17 provide that feedback.

18 MEMBER BEAUDET: Do you have any
19 research that is done to improve the compliance to
20 standards?

21 MS. KLEB: Heather Kleb, for the
22 record.

23 Yes we do. We do issue small
24 contracts to experts in the field and have them
25 review practices across Canada and internationally

1 and then we proceed to discuss those -- the outcome
2 of those studies with our members so that we can
3 develop some solid recommendations.

4 MEMBER BEAUDET: Thank you.

5 Thank you, Mr. Chairman.

6 CHAIRPERSON GRAHAM: Thank you,
7 Madam Beaudet.

8 Just two questions; first of all,
9 your association, you represent almost in its
10 entirety -- in electrical production or CANDU or
11 the slowpokes at universities and research
12 reactors.

13 If new technology comes along that
14 -- and we've heard this before because of the
15 uncertainties of what may happen at AECL and so on
16 and as the Deputy Minister told us when he was here
17 that the preference is a CANDU with the Ontario
18 government but it may not be if the future of AECL
19 doesn't achieve certain things.

20 What role will you play as an
21 association in other types of reactor technology if
22 they're adopted here in Canada?

23 MS. CARPENTER: Denise Carpenter,
24 for the record.

25 Mr. Chairman, we do have members

1 of our association AREVA, BNW, GE who are
2 developers of other technologies. So we are ready
3 and able to work with any technology that should be
4 selected.

5 Obviously we believe in a great
6 strong Canadian industry and part of that strong
7 Canadian industry is the research and development
8 and the leadership that's been shown by AECL over
9 the last 50 years in Canada.

10 So with that, over the last three
11 months actually, the Saskatchewan government has
12 been looking at modular technology and we've been
13 working with them to make sure we can get the facts
14 and the information together and indeed they've
15 been working with the regulator on trying to
16 understand the implications of that technology.

17 So I want to be very clear that
18 the Proponents of other technologies are part of
19 our membership as well.

20 CHAIRPERSON GRAHAM: Thank you.

21 From the time this panel was
22 struck and the time we started gathering
23 information from information requests and so on and
24 the work we did, we then came here under the --
25 just the tremendous disaster a few days before we

1 started these hearing in Japan.

2 And as you know, the nuclear
3 industry, after Chernobyl, certainly went into a
4 more or less a cocoon for a short time or for a
5 time.

6 What do you suspect or what do you
7 feel as an association with regard to lessons
8 learned and what will come out of Japan and how
9 long it will take before those lessons learned can
10 be incorporated here and within the nuclear
11 industry in Canada?

12 MS. CARPENTER: Well certainly the
13 industry worked together under very dire
14 circumstances starting that Friday afternoon and
15 helping the Canadian public understand the facts.

16 We were very concerned that during
17 a time of crisis people would be basing their
18 opinions on opinion and not on fact.

19 So we collaborated and worked
20 very quickly to make sure we had industry experts
21 out there as much as possible, helping Canadians
22 have a discussion based on fact, not opinion. So
23 that was the first stage.

24 The question you're -- the next
25 phase is we have to continue working with Canadians

1 what is not.

2 I know there's been a lot of
3 parallels drawn and so on, but it's to assure the
4 Canadian public that the nuclear industry and the
5 practices of the nuclear industry and your
6 association, and what you project to the public,
7 first of all, are understood by the ordinary
8 citizen that doesn't have a degree in science or
9 that, but just gets up in the morning and does
10 their job and lives their life.

11 And that's a concern that there's
12 a -- how do you generate security of mind to the
13 general public in Canada because of what's happened
14 in Japan and because of what's -- it's just the
15 unknown and that's -- that's, I think, your
16 challenge.

17 MS. CARPENTER: Yes. And, thank
18 you, Mr. Chairman.

19 We at the CNA take that role and
20 responsibility quite seriously. Indeed just
21 through our social media and our social networking,
22 we were online three weeks before the tsunami, and
23 -- and Fukushima devastated that plant and today we
24 have over 560 followers on our Twitter account,
25 which doesn't sound like a lot, but they are

1 qualified ongoing followers.

2 Our social media network has grown
3 100, a 1,000-fold since then. Since that Friday
4 afternoon, we've done over 300 interviews, put over
5 250 French and English experts in front of the
6 media to talk to Canadians, to talk with Canadians.
7 We've published on our websites, all our members'
8 websites. The CNA has a -- CNSC has a very robust
9 website.

10 We've all worked together to get
11 the facts out there for Canadians in -- in language
12 we can understand. And that's the most important
13 part, is it has to be in language we can all
14 understand.

15 So we've worked very hard to do
16 that, and I think, actually, the -- a compassed
17 media poll that just came out last week is showing
18 that, you know, 51 percent of people in Ontario
19 alone still have faith in our industry. And
20 actually 2 percent have increased the faith in our
21 industry.

22 Now, we don't have mass polling
23 across Canada yet, but we will very soon, and as an
24 industry we will be responding to that.

25 CHAIRPERSON GRAHAM: Thank you

1 very much, Madam Beaudet.

2 Do you have anything further, Mr.
3 Pereira?

4 If that's the case, then, we'll go
5 to OPG; do you have any questions or comments?

6 MR. SWEETNAM: Albert Sweetnam,
7 for the record.

8 No questions, but just two points
9 of clarity. One is that OPG actually does not work
10 towards compliance, we work well beyond compliance
11 to all standard and regulations. As you know work
12 with the ALARA principle, as low as reasonably
13 available, reasonably achievable.

14 The other comment was at all times
15 OPG -- at OPG we know where our fuel -- all of our
16 fuel is, and we know where all of our waste is. So
17 not most of the time, all of the time.

18 Thank you.

19 CHAIRPERSON GRAHAM: I have got a
20 note to ask what was the definition of most, and I
21 didn't, but I was -- when I heard you say most of
22 the time -- anyway, CNSC, do you have any
23 questions?

24 DR. THOMPSON: Patsy Thompson.

25 No, thank you, we don't.

1 CHAIRPERSON GRAHAM: Government
2 agencies, which there are none, I don't think.

3 Questions from the floor? I
4 understand -- yes, there's one from the floor.
5 Yes, sir?

6 --- QUESTIONS FROM THE PUBLIC:

7 MR. LEISTNER: Okay. My concern
8 stems from ---

9 CHAIRPERSON GRAHAM: Sir, would
10 you identify yourself, please?

11 MR. LEISTNER: I'm Ray Leistner.

12 My concern stems from the
13 experience of my father as a young teenager in
14 Germany in the 1940s.

15 He witnessed aircraft flying
16 overhead, they would then drop bombs over the
17 horizon. And then later on another wave of
18 aircraft would come from that horizon and drop
19 bombs on the other horizon.

20 And the reason why he survived is
21 because he was about 20 kilometres from the nearest
22 town.

23 Now, if there had been nuclear
24 reactors at those targets, I would likely not be
25 here. Now, up to the modern world, back in 1991 --

1 CHAIRPERSON GRAHAM: Could you put
2 your question please.

3 MR. LEISTNER: Yeah, the -- in
4 1991 the U.S. developed a device called the GBU28,
5 which can penetrate 20 feet of reinforced concrete
6 with one shot and detonate an over 600-pound high
7 explosive inside.

8 As I understand, our reactors have
9 approximately 1.2 metres of concrete on the
10 containment vessel. So if there's ever a war on
11 Canadian soil in the next 60 years, 100 years, they
12 would not be safe under those conditions.

13 And I'm asking for a five-time
14 safety factor, will the reactors be constructed
15 with a 100-foot thick containment vessel to prevent
16 them being used as targets in case there ever is a
17 war over Canadian resources sometime in my
18 lifetime?

19 And as weapons improve, will they
20 be upgraded?

21 CHAIRPERSON GRAHAM: Your
22 question?

23 MR. LEISTNER: Yeah, will they be
24 using a 100-foot thick containment vessel to
25 protect against modern bunker-busting weapons?

1 CHAIRPERSON GRAHAM: Thank you for
2 your question.

3 Because of sensitivity of security
4 I have to be very careful to -- not to disclose
5 what our security measures are in this country.

6 But Mr. Howden, can you add
7 anything that can at least enlighten the
8 questioner, please?

9 MR. HOWDEN: Barclay Howden
10 speaking.

11 I think there's sort of two
12 facets. I talked about the design basis threat,
13 which is what the plants have to be able to defend
14 against, but also there's the nature of the
15 robustness of the facility, and this needs to be
16 built in as well.

17 CHAIRPERSON GRAHAM: Thank you
18 very much.

19 To your organization, Ms.
20 Carpenter, and your team, thank you very much for
21 appearing before us today.

22 Well, I have a notice that just
23 before you go that Mr. Kalevar would like to have a
24 question.

25 I want to remind you, Mr. Kalevar,

1 before you do, this is day 12, you've had 72
2 questions so far, 10 times more than anyone else.
3 I want your question to be relevant and to the
4 point or I'm going to rule you out of order.

5 And I'm warning you right now that
6 out of those 72 questions, many of them were not
7 relevant and I've been very tolerable, but I now
8 ask you to put your question concisely and to the
9 point, to the Chair.

10 MR. KALEVAR: Through the Chair.

11 What has CNA learned from the
12 experience in Japan?

13 CHAIRPERSON GRAHAM: Would you
14 care to answer, Ms. Carpenter?

15 MS. CARPENTER: Thank you. Thank
16 you for the question.

17 What has the CNA learned from
18 Japan? We've learned that we have an industry that
19 can work together. We have learned that we have an
20 industry that's focused on safety first.

21 And we've learned that the most
22 important part of all of that is helping Canadians
23 understand that and to work with Canadians to have
24 those discussions on how our industry is committed
25 to being safe in their communities and being part

1 of their communities.

2 CHAIRPERSON GRAHAM: Thank you
3 very much.

4 And with that, I thank you very
5 much for coming today and presenting to us.

6 And may you have safe travels
7 back, and may your lessons learned from the
8 tragedies in Japan contribute to us going forward
9 or not -- not us, but the industry going forward in
10 Canada.

11 With that the Joint Review Panel
12 now has a few minutes, and I think we will move to
13 consider some of the written interventions. And I
14 will ask the co-manager to proceed and read some of
15 those PMDs into the record and she will read them
16 in series and there will be questions from various
17 -- from the panel members and panel members only.

18 --- WRITTEN SUBMSSIONS AND COMMENTS BY THE PANEL:

19 MS. McGEE: Thank you, Mr. Chair.

20 The first written submission for
21 the joint review panel's consideration is PMD 11-
22 P1.200 from the Métis Nation of Ontario.

23 CHAIRPERSON GRAHAM: Just give us
24 a moment there.

25 Mr. Pereira, do you have a

1 question or comment?

2 MEMBER PEREIRA: Thank you.

3 In this PMD, the Métis Nation of
4 Ontario recommends the panel request the Minister's
5 approval be conditional upon OPG committing to
6 develop a mutually agreeable work plan with the
7 Métis Nation of Ontario, which includes the
8 following:

9 The inclusion of Métis species of
10 interest in the planting of the Darlington
11 waterfront trail to assist Ontario Power Generation
12 to meet their no net loss targets.

13 The inclusion of Métis traditional
14 knowledge in the Darlington Information Centre and
15 on plaques along the Darlington waterfront trail;
16 and the inclusion of the Métis Nation of Ontario in
17 the development of an aboriginal procurement policy
18 specific to the Darlington new nuclear plant
19 project and to encourage economic development and
20 employment opportunities for Métis people and
21 businesses in the area.

22 I put this -- these three points
23 to Ontario Power Generation for their comments and
24 reaction to the request from the Métis Nation of
25 Ontario.

1 MR. SWEETNAM: Albert Sweetnam,
2 for the record.

3 I'll ask Donna Pawlowski to
4 respond to this question.

5 MS. PAWLOWSKI: Donna Pawlowski,
6 for the record.

7 With respect to the first two
8 points regarding the incorporation of Métis
9 knowledge and species of interest in the planting
10 of the Darlington waterfront trail, when we entered
11 into the agreement with the Métis Nation of Ontario
12 to undertake the traditional knowledge study that
13 was submitted to the panel in October of 2010, part
14 of the agreements spoke to these matters because we
15 wanted to ensure that the work would not just go to
16 the panel, but we would be able to use it somehow.

17 And so we already have an
18 agreement with the Métis Nation of Ontario that OPG
19 will, now that the report has been completed,
20 consider the inclusion of local traditional
21 knowledge in our public information session at the
22 Darlington site.

23 And one of the things we
24 specifically have been talking about has been if we
25 develop plaques on the waterfront trail we might

1 include reference to some of the local Métis
2 species that have been used and provide a
3 historical perspective about how they have been
4 used by the Métis people.

5 MEMBER PEREIRA: And the third
6 point, the inclusion of Métis Nation of Ontario in
7 the Aboriginal procurement policy specific to your
8 project and to -- this is looking for economic
9 development and employment opportunities for Métis
10 people.

11 MS. PAWLOWSKI: Donna Pawlowski,
12 for the record.

13 Yes, there is no specific
14 Aboriginal procurement policy for this project.

15 However, as we mentioned before,
16 OPG's Aboriginal relations policy for the company,
17 which deals with all of our current and future
18 projects, is to ensure that we work with our
19 Aboriginal communities proximate to our sites and
20 to our projects and to explore opportunities for
21 economic and business opportunities, and we're
22 committed to doing that.

23 MEMBER PEREIRA: Thank you.

24 Thank you, Mr. Chairman.

25 CHAIRPERSON GRAHAM: Madam

1 Beaudet, anything to add?

2 MEMBER BEAUDET: No, I had the
3 same concerns, especially for the third point.

4 For any Aboriginal groups in
5 Ontario there is no procurement policy like the
6 equivalent you would have, for instance, for the
7 Cree with the James Bay Agreement. Is that what we
8 understand?

9 MR. SWEETNAM: Robert Sweetnam,
10 for the record.

11 That is correct. Ontario has --
12 Ontario last year issued a clear directive to all
13 of its agencies in terms of what procurement looks
14 like in Ontario, and the procurement policy is
15 very, very clear, that all procurement needs to be
16 competitive.

17 The way we involve the Métis and
18 the other First Nations is through assistance to
19 them in the bidding process, assistance and support
20 for them to develop the capacity to be able to bid
21 on the projects, the breaking down of the projects
22 into small enough sizes so that their organizations
23 and their companies can become involved. But they
24 have to participate in an overall competitive
25 process.

1 MEMBER BEAUDET: Thank you.

2 Thank you, Mr. Chairman.

3 CHAIRPERSON GRAHAM: Thank you,

4 Madam Beaudet.

5 Ms. McGee?

6 MS. MCGEE: Thank you, Mr. Chair.

7 The next group of written

8 submissions for the joint review panel's

9 consideration are: PMD 11-P1.32 from Mira Pavan;

10 PMD 11-P1.35 from Donna Topping; PMD 11-P1.36 from

11 Dan Young; PMD 11-P1.42 from James Carmichael; PMD

12 11-P1.69 from Zeina Rachele; PMD 11-P1.79 from

13 Samer Zabana; PMD 11-P1.215 from Raihan Khondker;

14 and PMD 11-P1.217 from Justin Cole.

15 CHAIRPERSON GRAHAM: Panel members

16 for comments? Madam Beaudet?

17 MEMBER BEAUDET: All of these PMDs

18 are in support of the project and they mainly talk

19 of positive effects for Durham and Canada as an

20 exporter of nuclear power.

21 Also, some comments about OPG

22 being a great supporter of the community and a good

23 neighbour and having a strong safety structure and

24 providing efficient power that is safe and reliable

25 and environmentally responsible.

1 Being opinion submissions, I have
2 no questions.

3 CHAIRPERSON GRAHAM: Mr. Pereira,
4 do you have anything else to add?

5 MEMBER PEREIRA: I have no
6 comments on these submissions.

7 CHAIRPERSON GRAHAM: I just want
8 to note that one of the intervenors also is
9 recognizing the importance of educational
10 institutes and what the nuclear industry has
11 contributed to that, especially OPG's financial
12 support.

13 With that I have no others.

14 Ms. McGee, do you want to go ahead
15 with another group?

16 MS. MCGEE: No.

17 CHAIRPERSON GRAHAM: Okay. That's
18 all of the written that we are going to do today.
19 Tomorrow is Sunday, and it's a day off, and we're
20 going to reconvene on Monday morning at 9 a.m.

21 Do you have anything else to add
22 before we do?

23 Thank you very much everyone. A
24 good day off, a good Sunday, and we will see you on
25 Monday morning.

1 Thank you very much.

2 --- Upon adjourning at 4:40 p.m. /

3 L'audience est ajournée à 16h40

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C E R T I F I C A T I O N

I, Alain H. Bureau a certified court reporter in the Province of Ontario, hereby certify the foregoing pages to be an accurate transcription of my notes/records to the best of my skill and ability, and I so swear.

Je, Alain H. Bureau, un sténographe officiel dans la province de l'Ontario, certifie que les pages ci-hauts sont une transcription conforme de mes notes/enregistrements au meilleur de mes capacités, et je le jure.



Alain H. Bureau