Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public meeting

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Salle d'audiences publiques
14e étage
280, rue Slater
Ottawa (Ontario)

Commission Members present

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

Commissaires présents

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

Secretary:

Mr. Marc Leblanc

Secrétaire:

M. Marc Leblanc

Senior General Counsel :

Mr. Jacques Lavoie

Avocat général principal:

M. Jacques Lavoie

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Ottawa, Ontario

--- Upon commencing at 9:01 a.m./
L'audience débute à 9h01

Opening Remarks

MR. LEBLANC: Bonjour, Mesdames et Messieurs. Bienvenue à la continuation de la réunion publique de la Commission canadienne de sûreté nucléaire.

We have simultaneous translation. Please keep the pace of speech relatively slow so that the translators have a chance to keep up.

Des appareils de traduction sont disponibles à la réception. La version française est au poste 3 and the English version is on channel 2.

Please identify yourself before speaking so that the transcripts are as complete and clear as possible.

La transcription sera disponible sur le site web de la Commission dès la semaine prochaine.

I'd also like to note that this proceeding is being video webcasted live and that archives of these proceedings will be available on our website for a three-month period after the close of the proceedings.

Please silence your cell phones and other electronic devices.

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

President Binder.

THE CHAIRMAN: Merci, Marc.

Good morning and welcome to the continuation of the meeting of the Canadian Nuclear Safety Commission.

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

Je vous souhaite la bienvenue. And welcome to all of you who are joining us via webcast or teleconference.

I'd like to begin by introducing the Members of the Commission that are with us for today. On my right is Dr. Moyra McDill and Mr. Dan Tolgyesi; on my left is Ms. Rumina Velshi, Dr. Ronald Barriault and M. André Harvey.

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

Marc?

MR. LEBLANC: The *Nuclear Safety and*

Control Act authorizes the Commission to hold meetings for the conduct of its affairs.

The agenda was approved yesterday. Please refer to the agenda 12-M21.B for the complete list of items to be presented today.

In addition to the written documents reviewed by the Commission for today's meeting, CNSC staff, licensees and intervenors will have an opportunity to make presentations and Commission Members will be afforded an opportunity to ask questions on the items before us.

Mr. President.

6. Status Report

THE CHAIRMAN: Okay, let’s start with a status report on power reactors which is described in CMD 12-M24.

Mr. Rzentkowski, the floor is yours.

6.1

Status Report on Power Reactors

DR. RZENTKOWSKI: Thank you very much, Mr.

President, Members of the Commission.

I would like to provide a further update to the information provided in the CMD. There are some important changes which I would like to bring to the Commission's attention.

Section 1.1, Bruce A, Unit 2; the unit is currently at low power. Synchronization with the grid is scheduled for later this week. This is the final milestone in the multi-year refurbishment project. It means that the unit will start producing power later this week.

Section 1.2, Bruce B, Unit 5 and 8; Unit 5 has been derated to 78 percent and Unit 8 to 50 percent of full power to support Hydro One work on transmission lines. Return to full power is expected today.

Section 1.5, Pickering A, Unit 1; unit is returning from the forced outage and is currently holding at 76 percent of full power.

Section 1.6, Pickering B, Unit 5 and 6; Unit 5 is at full power; Unit 6 is derated to 96 percent power of full power low due to low regional overpower margin following refuelling. There are some problems with liquids zone level control valve response. Power raises are on hold until the problems are resolved.

A Point Lepreau refurbishment; the process of refuelling the primary heat transport system started on May 1st. This will be followed by the system pressure test, the reactor building leak rate test and primary heat transport system cold flow measurements before the next regulatory hold point associated with the removal of shutdown guarantees.

This concludes my update to the power reactor status report. Thank you.

THE CHAIRMAN: Thank you.

Okay, question?

Dr. Barriault?

MEMBER BARRIAULT: Thank you, Mr. Chairman.

On Pickering B, Unit 5, you mentioned that there's a problem with the fuel handling system. Do you care to comment on the extent of this problem, how serious is it?

DR. RZENTKOWSKI: Unit 5 is currently at full power operation.

MEMBER BARRIAULT: So is there or isn't there a problem with the fuel handling computer on that unit?

DR. RZENTKOWSKI: No, there is no problem anymore.

MEMBER BARRIAULT: Okay.

My next question, if I may, Mr. Chairman, on Point Lepreau we had discussed the issue of seismic testing. What is the status of that activity at this time?

DR. RZENTKOWSKI: I believe the reference has been made to the seismic -- site specific seismic assessment which was requested as a part of the Point Lepreau relicensing hearings.

Is that correct?

MEMBER BARRIAULT: That's correct, yes.

What is the status of this?

DR. RZENTKOWSKI: I will ask Mr. Phil Webster, who is our lead for the compliance activities in relation to Fukushima follow-up actions to provide an update.

MEMBER BARRIAULT: Thank you.

THE CHAIRMAN: Go ahead.

MR. WEBSTER: Thank you, Dr. Rzentkowski.

For the record, my name is Philippe Webster. I'm the Darlington Regulatory Program Director.

As the Commission will learn later on today, there are a number of, what we're calling, Fukushima action items that have been placed on the industry as a result of the findings of our Fukushima task force, and one of them is to re-evaluate the external hazards for each of the sites.

If you give me a minute I can refresh my memory as to the status for Point Lepreau. But my recollection is that this has been done adequately as part of the PRA that was performed for the refurbishment activity.

THE CHAIRMAN: Can we maybe push this to the next hearing on the Fukushima task force and you'll have time to refresh yourself on the status.

DR. RZENTKOWSKI: Thank you. But I would like to ensure the Commission that the project plan has been received by the Commission in January of this year, and if my memory serves me correctly, by the end of this calendar year we should have the preliminary results.

THE CHAIRMAN: Okay, thank you.

MEMBER BARRIAULT: Thank you.

THE CHAIRMAN: Dr. Barriault?

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

THE CHAIRMAN: Anybody else, question?

Ms. Velshi?

MEMBER VELSHI: For Bruce A, Unit 3, is it still shutdown or is it out of outage now that the 160 days, I guess, have come and gone?

DR. RZENTKOWSKI: I will ask Mr. Bob Lojk, who is the Acting Director for Bruce Regulatory Program to respond to this question.

MR. LOJK: For the record, my name is Bob Lojk. I'm the Acting Director of the Bruce Regulatory Program Division.

The restart has not taken place yet. The refurbishment work is still going on in that unit.

MEMBER VELSHI: Thank you.

And for Darlington, Unit 3, where you talk about high tritium levels in the vault, are there any safety implications of that as far as higher worker doses or emissions?

DR. RZENTKOWSKI: There were no implications to the workers or to the public.

Mr. Phil Webster may provide more detail if the Commission wishes to do so.

MR. WEBSTER: Thank you, Dr. Rzentkowski.

Yes, I can confirm that was the case. Typically when the pressure in the primary circuits is reduced, the closure pillars at each end of the end fitting on each channel do tend to leak. These particular ones leaked more than normal and for a time the tritium concentration in the vault did increase, but this has now been resolved and workers are able to go in the vault as normal to perform activities.

THE CHAIRMAN: Thank you.

Anybody else?

Let me ask -- I always like to have an update on the status. At Point Lepreau so, what is now the expected coming back online date?

DR. RZENTKOWSKI: The official project timeline hasn’t been revised by New Brunswick Power so I believe New Brunswick Power would be in a better position to answer this question.

THE CHAIRMAN: Okay, I think we’ll have some New Brunswick people later on when we are -- they’re already -- I know, but I’ll defer it for the next time, give you a chance to know what I’m going to ask.

And on Bruce A, I guess Unit 2 -- just somebody remind me -- so it’s coming back on to the grid after how long it’s been off.

I mean, I assume Bruce -- the Bruce people are quite happy about that.

DR. RZENTKOWSKI: This unit was laid up in the mid-‘90s, if I could remember in 1995, so it’s coming back to service after 17 years of lay-up and refurbishment activities towards the end of it.

THE CHAIRMAN: Almost seems to me that it just proves the idea of a shelf life as being something ---

DR. RZENTKOWSKI: That’s right. We can put something on the shelf and then undust it and start using again. It's almost like an old book.

THE CHAIRMAN: So there is no end of life kind of a notion?

DR. RZENTKOWSKI: No end of life and it appears it never goes out of fashion either.

THE CHAIRMAN: I think it's a bit of a nuclear humour here.

Okay, anybody else?

Okay, thank you.

Let's move on to early notification report and starting with OPG reporting on workplace fatality at the Darlington Nuclear Generating Station, as outlined in CMD 12-M28.

Mr. Rzentkowski, the floor is still yours.

6.2 Early Notification Reports

6.2.1 - 12-M28

Ontario Power Generation Inc.:

Workplace fatality at OPG's

Darlington Nuclear Generating

Station

DR. RZENTKOWSKI: Thank you very much, Mr.

President.

CNSC staff regrets to inform the Commission of a death of an OPG control technician while performing work on Darlington Unit 3.

It was determined to be of natural not work-related causes and currently Ministry of Labour decided to close this investigation. So there is no further follow-up from the perspective of the CNSC staff.

THE CHAIRMAN: Question?

Dr. Barriault?

MEMBER BARRIAULT: I'm sorry, Mr. Chairman.

On the issue of, I guess, of training.

Is there CPR training for the employees? Is that mandatory or there's no training given to the employees at the power plant?

MR. RZENTKOWSKI: There is always an emergency response team on standby at the site. So I think the team reacted as per procedures.

But I will ask Mr. Phil Webster to provide more details or eventually we may direct this question also to OPG management who is present in the room.

MEMBER BARRIAULT: Right.

MR. WEBSTER: Thank you, Dr. Rzentkowski.

That's correct, there is an emergency response team available at all time on site. They did attend the scene. They used the defibrillator. They performed CPR until such time as the ambulance arrived when the EMS took over and the person was transported to Bowmanville Hospital where he was pronounced deceased.

MEMBER BARRIAULT: Okay. Do we know the age of this employee?

MR. WEBSTER: He was 66 years old.

MEMBER BARRIAULT: Thank you.

Thank you, Mr. Chairman.

THE CHAIRMAN: So I'm just relating to the cause of death was not work related. Who -- I assume it's not the police who makes those statement.

MR. RZENTKOWSKI: No, this was determined in the hospital and ultimately OPG made the statement.

THE CHAIRMAN: Okay. Thank you.

Anybody else?

Okay. Thank you.

Okay. We move to the next ENR.

Alors, le prochain rapport sous le numéro 12-M29 est au sujet d'Hydro-Québec pour une fuite d'eau lourde dans le bâtiment réacteur à Gentilly-2.

Alors, Monsieur Rzentkowski, vous avez la parole.

6.2.2 - 12-M29

Hydro-Québec:

Fuite d'eau lourde dans le bâtiment réacteur à Gentilly-2

M. RZENTKOWSKI: Merci beaucoup, monsieur le président.

Veuillez trouver un rapport de notification rapide des événements survenus à la Central nucléaire Gentilly-2. Je vous le résume ici.

Le jeudi, 26 avril, Hydro-Québec informait la CCSN d'une petite fuite de l'eau du circuit du caloporteur dans le bâtiment du réacteur. Deux travailleurs ont reçu une très faible dose de 0.02 et 0.03 millisievert respectivement.

Il y a eu un rejet dans l'environnement bien en deçà des limites réglementaires. Cet événement n'a pas posé de risques pour la population.

Le personnel d'Hydro-Québec et notre personnel est disponible pour répondre à vos questions.

Merci.

LE PRÉSIDENT: Des questions?

Docteur Barriault?

MEMBRE BARRIAULT: Oui, monsieur le président.

Pour Hydro-Québec, la fuite est rentrée

d’un système de ventilation. C’est la ventilation de quoi; du contenant ou bien la ventilation du plan?

Est-ce qu’il y a quelqu’un d’Hydro-Québec ici?

M. RINFRET: Est-ce que vous voulez qu’on réponde à cette question?

MEMBRE BARRIAULT: Oui, si possible. Les gens d’Hydro-Québec sont ici, oui.

M. DÉSILETS: Mario Désilets, directeur, Production nucléaire pour Hydro-Québec.

Le débordement a atteint ce qu’on appelle le système de ventilation du bâtiment réacteur.

MEMBRE BARRIAULT: O.k. Le système de ventilation du réacteur?

M. DÉSILETS: Oui.

MEMBRE BARRIAULT: O.k. Alors, c’est le même système de ventilation pour les employés aussi ou bien c'est un système différent?

M. DÉSILETS: C’est un -- y a plusieurs systèmes de ventilation mais c’est le même système qui ventile pour les aires accessibles du bâtiment réacteur là où les employés peuvent circuler.

MEMBRE BARRIAULT: Circuler. Alors, le tritium irait dans l’air ambiant qu’on respire?

M. DÉSILETS: Y est allé dans l’air ambiant et on a un moyen de surveillance. Les salles de commande l'a détecté immédiatement puis on a procédé à l'évacuation du bâtiment réacteur.

MEMBRE BARRIAULT: O.k. Merci.

Merci, monsieur le président.

LE PRÉSIDENT: Monsieur Harvey?

MEMBRE HARVEY: Au personnel, quand vous dites une petite fuite en deçà des limites, ça comprend le 10 litres et le 60 litres dans la conduite. C'est 70 litres. Est-ce que -- c'est le total et c'est ça qui est considéré une petite ---

M. RZENTKOWSKI: À mon côté, monsieur François Rinfret, le directeur du Programme de la réglementation de Gentilly-2. François va répondre à cette question.

Merci.

M. RINFRET: Merci, Docteur Rzentkowski.

François Rinfret, directeur du Programme pour Gentilly-2.

Lorsqu'on parle de fuite ou d'un déversement, on prend l'ensemble de la quantité qui est sortie de son circuit. Donc, on considère le 10 litres sur le plancher puis quelques litres de plus dans le système de ventilation. Oui, c'est l'ensemble de cette fuite.

MEMBRE HARVEY: Et une fuite reportable ou plus grande là que vous ne considériez pas petite fuite ce serait quoi?

M. RINFRET: On essaie de remettre les choses en perspective pour -- ça n'a pas de signification le mot petit, moyen ou grand dans ce cas-là. On n'a pas vraiment de catégorie. On essaie de remettre en perspective en termes de risques, en termes de débordements aussi dans le système pour mieux comprendre l'événement.

Donc, dans ce cas ci, c'est une fuite interne dans un bâtiment du réacteur; donc, il est conçu pour recevoir ces déversements-là et les travailleurs étaient habilités et protégés avec des vêtements de protection adéquats. Donc, on attendait quelque chose comme ça éventuellement.

Donc, petite fuite de 60 litres ou 60 quelques litres là et faibles risques pour la population parce que ça donne dans l'environnement une limite journalière de rejet d'à peu près 1 pourcent.

MEMBRE HARVEY: Mais si petite fuite veut rien dire, faudrait peut-être pas l'utiliser. Il faudrait peut-être utiliser d'autres mots parce que nous on regarde ça puis on dit petite fuite.

M. RINFRET: C'est difficile de répondre à votre question. On essaie de le faire pour mettre en perspective l’ampleur de l’événement-là.

LE PRÉSIDENT: Non, non, mais écoute, est-ce que ce n'est pas vrai, on n’a pas de -- on n’a pas une définition précise pour le mot "petite". Il faut utiliser le jugement pour considérer les circonstances quand on doit rapporter un incident.

M. RINFRET: Voilà. Je l’exprime d’une manière assez brutale mais c’est à peu près ça. On n’a pas vraiment de définition précise pour la quantité ou le volume de l’eau qui a été rejeté.

MEMBRE HARVEY: Je comprends bien ça mais je me dis si "petite" a pas de signification, vaudrait mieux pas l’utiliser, essayer d’exprimer les choses autrement. Ça va pour ça.

Hydro-Québec, Monsieur Désilets, les alarmes, vous avez une -- est-ce que vous avez une vérification systématique de ces alarmes-là? Vous en avez combien -- d’abord vous avez combien de réservoirs d’eau lourde et combien d’alarmes comme ça qui pourraient ---

M. DÉSILETS: Mario Désilets pour le verbatim.

Le débordement est survenu lors d’une manœuvre de machine à chargement du combustible. Y a deux réservoirs; un réservoir sur chacune des machines qui est situé dans le sous-sol du bâtiment réacteur. Et y a -- sur le réservoir, il y a quatre alarmes; très bas niveau, bas niveau, haut niveau, très haut niveau.

Et en plus de la surveillance des niveaux sur les réservoirs, comme j'ai dit tantôt, la salle de commande a, en continu, une indication du taux de concentration de tritium dans le bâtiment réacteur.

Alors, comme les alarmes ont eu une difficulté -- y ont eu une problématique, y ont détecté par l'appareil de mesure de contamination dans l'atmosphère qu'il y avait une fuite. En arrêtant les activités de la machine à combustible, la fuite a arrêté immédiatement.

MEMBRE HARVEY: Mais ces alarmes-là, si y ont pas fonctionné, je répète ma question; est-ce que les alarmes sont vérifiées périodiquement? Est-ce que vous faites des tests?

M. DÉSILETS: Mario Désilets.

Y a un programme d'entretien préventif qui est fait sur les alarmes. On est actuellement en investigation. Les détecteurs de niveau c'est des détecteurs de conductivité et y a eu une -- y a eu une problématique au niveau du -- au niveau de la conductivité du caloporteur puis on est en train d'investiguer les raisons pour lesquelles c'est arrivé.

Entretemps, on a donné instruction à nos opérateurs avec un deuxième moyen de surveillance pour être sûr qu'ils sont capables de détecter si l'alarme fonctionne ou fonctionne pas. Y ont un autre moyen actuellement palliatif auquel y démarrent la pompe pour drainer le réservoir avant que celui-ci déborde.

MEMBRE HARVEY: C'est ça l'autre moyen qu'ils ont là, c'est de partir la pompe?

M. DÉSILETS: Oui. Autrement la pompe part automatiquement sur les détecteurs de niveau. Fait qu'on leur a donné un autre moyen de surveillance qui leur permet de démarrer la pompe si jamais le détecteur de niveau rentre pas en fonction.

MEMBRE HARVEY: J'aimerais avoir les commentaires du personnel si ça correspond aux pratiques et si c'est normal.

M. RINFRET: François Rinfret pour Gentilly-2.

Ce qu'on doit encore attendre c'est la suite des événements. C'est un événement qui est tout récent. Alors en attendant, le titulaire nous a donné -- nous a parlé d'une pratique temporaire pour permettre de fonctionner normalement et sans risques et c'est ce qu'on va voir au cours des prochains jours, prochaines semaines, et dans le rapport qui va arriver à la mi-juin, c'est la méthodologie qui sera utilisée.

On n'imposera pas une méthodologie. Typiquement, c'est le titulaire qui est responsable de la sûreté et qui propose une façon de gérer le problème d'une façon plus permanente, donc, avec la modification de l'ingénierie qu'on attend à voir, quelque chose comme ça.

MEMBRE HARVEY: Est-ce que c'était la première fois qu'il y avait des problèmes avec ces alarmes?

M. DÉSILETS: Monsieur Harvey, je veux juste revenir sur la question précédente. Il y a une modification qu'on va faire pour améliorer -- pour donner une deuxième mesure de niveau aux opérateurs en salle de commande, plutôt que de faire la surveillance qu'ils font actuellement de façon temporaire, le temps qu'on fasse notre modification.

À votre question, c'est arrivé, à ma connaissance, une fois il y a plusieurs années, le même problème.

MEMBRE HARVEY: Donc, on va attendre les résultats qui viendront. Merci.

LE PRÉSIDENT: Monsieur Tolgyesi.

MEMBRE TOLGYESI: Juste une petite. Ce que vous avez dit que le haut niveau -- l'alarme de haut niveau n'a pas fonctionné sur un des réservoirs, donc il a débordé dans un autre réservoir qui s'est rempli rapidement et débordé dans le conduit.

Est-ce que ce deuxième réservoir, il n'a pas le niveau, un haut niveau, une alarme de haut niveau? Parce que s'il y en avait, ça devrait arrêter?

M. DESBIENS: Patrice Desbiens, Chef des services techniques à Gentilly-2.

Oui, effectivement, le deuxième réservoir a son indication de niveau et son automatisme pourrait être drainé, mais il est tout petit. Il est tout petit alors il a rapidement été ennoyé et l'arrivée d'eau était plus rapide que sa capacité à se drainer.

Alors, c'est pour ça qu'il a débordé, lui aussi.

MEMBRE TOLGYESI: Bon. Ça veut dire que vous n'avez pas une mesure d'urgence ou une capacité qui permettrait de collecter cette eau-là avant de se rendre, je ne sais pas, dans le conduit de ventilation ou couler par terre, ou ailleurs?

M. DESBIENS: Patrice Desbiens.

Le deuxième réservoir a subi la même conséquence que le premier, mais la solution réside dans le renforcement de la détection de niveau puis de l'automatisme du premier réservoir. Le deuxième a -- on ne peut pas régler la problématique à ce niveau-là. Donc, c'est vraiment en ajoutant ou en doublant la capacité de détection au niveau du premier qu'on va régler le problème de façon définitive.

LE PRÉSIDENT: O.k.

MEMBRE HARVEY: Une dernière question. C'est quoi la capacité des réservoirs?

M. DÉSILETS: Le réservoir -- le premier réservoir, il a une capacité de 1 000 litres.

MEMBRE HARVEY: O.k. Merci.

LE PRÉSIDENT: O.k. Merci beaucoup. O.k. Merci beaucoup.

We are moving on to information items, and this is actions required by CNSC licensees to address the Task Force recommendations on post Fukushima.

So I guess there are going to be some seating rearrangements. I'll give you a minute to do that.

(SHORT PAUSE/COURTE PAUSE)

MR. LEBLANC: I would only like to mention a bit how this is going to proceed this morning. So we're starting with the presentation by staff. I understand the presentation is to last about one hour. That will be followed by a first round of questions by the Commission Members and then we're going to proceed with the interventions. We have 10 oral interventions and one written submission, and we're going to close with an in camera session on confidential security matters that will take place at the end of the day.

Thank you.

THE CHAIRMAN: Thank you, Marc.

So we are now proceeding to deal with the CNSC Fukushima Task Force Report and CNSC Management Report, as outlined in CMD 12-M23 and 12-M23.B.

5. Information Items

5.1 Actions required by the CNSC,
Licensees and affected stakeholders
to address the Task Force recommendations
and outcome of the public consultation
on the *CNSC Fukushima Task Force Report*
and *CNSC Management Response*

THE CHAIRMAN : Before we start, I just would like to give a little bit of a context to another report that was tabled, and that is the report of the External Advisory Committee, which I commissioned to give a personal, if you like, comfort level that the process that staff were engaged in in assessing all the issues post-Fukushima or the lessons learned were done in a proper way, in a proper manner, and we selected three wise men who are experts in their fields in engineering, in innovation, in governance and safety, and a real good qualification was that they were not from the nuclear sector.

And they were able to go and talk to whoever they wanted to, and they did, and they assessed the process and tabled the report, and I thought that this report should be, for transparency reasons, tabled and should form as an input into the staff action plan, and that's why you got a late CMD that incorporated what the staff did on their own, and they tried to incorporate the Advisory Committee recommendations so you've got a full plan ahead of you.

So I hope that explains a little bit of the context, and we'll proceed along those lines.

So just before we start, I'd like to recognize that we have a lot of interested parties in here, and also, we're going to hear from the intervenors, but in addition, to assist the deliberation we have Mr. Pierre Trudel from Public Safety Canada. I assume he's here.

We have Dr. John Adams, a seismologist from NRCan.

We have three representatives from Health

Canada: Mr. Brian Ahier, Ms. Beth Pieterson and Mr. Jean-Patrice Auclair.

And we also have Mr. Greg MacCallum from New Brunswick Emergency Measures Organization and Mr. Pierre Racine du Ministère de la sécurité publique de la région de la Mauricie et du Centre-du-Québec.

So those people are here to help us along in some of our deliberations.

We also have, by teleconference, three representatives from Emergency Management Ontario: Mr. Michael Morton, Mr. David Nodwell and Ms. Kathy Bleyer.

Can you hear us?

MS. BLEYER: Yes, good morning.

THE CHAIRMAN: Yes, good morning.

Okay. Mr. Rzentkowski, please start. Mr. Jammal, please start, one of you.

12-M23/12-M23.B

Oral presentation by

CNSC Staff

M. JAMMAL: Both of us, sir.

Bonjour, Monsieur le Président, membres de la Commission. Pour l'enregistrement, je suis Ramzi Jammal, Premier vice-président et chef de la règlementation des opérations.

On est auprès de vous pour vous présenter le plan d'action réglementaire du personnel de la Commission. Ce plan d'action est fondé sur des faits scientifiques et élaborés selon un processus et une révision rigoureuse effectués par le personnel.

CMD 12-M23 and 12-M23.B describe the outcome of the CNSC comprehensive stress test for nuclear power plants in Canada.

Shortly after the tragic events of Fukushima, I established, under my authority, the Fukushima task force to evaluate the regulatory implications for operating Nuclear Power plants; in order to provide means; to enhance safety; where needed the health and safety of Canadians and the environment.

Mr. President, my introduction is a bit long, but before I go any further, I would like to introduce to you our Fukushima task force members, who work tirelessly and diligently to review the events of Fukushima, to review the licensees responses, to review the international regulatory deports.

The task force success is based on collaboration of our staff at the CNSC and subject matter experts who provide that support.

So I will ask the staff members to put

their hands up for you to recognize who they are. You know most of them, but some of them are the first time before you.

So I will start with the Chairman of Task Force is Dr. Greg Rzentkowski, at my left. The Vice-Chair of the Task Force is Mr. Gerry Frappier, on my right.

By the way, to save some time, I'm not going to tell you what their real day jobs are in addition to the Fukushima Task Force, I'll just give the names.

Mr. Pat Hawley, he is retired from the CNSC. Unfortunately, he could not be with us today, but he was Director, Technical Lead. Mr. Chris Hardwood, Technical Specialist, and Mr. Harwood led the deterministic safety analysis review, and he's the lead author of the task force report, so we can blame him for everything that doesn't work.

Dr. Hatem Khouaja, he's the Technical Advisor, Scientific Secretary of the Task Force; Madam Chantal Morin, Technical Specialist. She led the probabilistic safety assessment reviews.

Dr. Dave Newland, as a Director, day job, he led the requirements for new build and new design requirements.

Mr. Luc Seguin, Director. He led the emergency responses review; Mr. Al Thibert, on my left, Senior Regulatory Program Officer, the Project Manager, and we call him the chief in command, the whip. And he is the lead author of the CMD and the action plan.

Also with us is Mr. Garry Schwartz, a retired Director from the CNSC who played a key role on the international scene, who assisted the Romania regulator to prepare their stress test at the request of the European Council, and the report is out putting us at par.

And the Fukushima Task Force report, without bragging too much, of the CNSC, if not at par, has exceeded some of the requirements.

Donc, monsieur le président, membres de la Commission, CNSC staff issued orders under 12(2) requests to all major facilities commensurating with risk. On March 17th, 2011, an order was issued to all nuclear power plants and major reactors.

On March 24th, 2011, an order was issued to all uranium mines processing facilities in order to review their safety cases and establish if there are any gaps with respect to emergency management, external hazards and following the same lines of the actions in our action plan.

Thirdly, on March 21st, the order was issued to TRIUMF, CLS and other Class II facilities in order to review their safety cases.

To conclude my introduction, we are before you to seek the Commission's acceptance of the CNSC action plan in order to strengthen reactor defence in depth and enhance emergency preparedness and response.

The emphasis is on accident mitigation in order to effectively deal with highly unlikely events, regardless of the cause or regardless of the cause of the event, that it be safety or security, because I want to make it clear that the reactors will shut down safely and remain in a safe shutdown state to protect the public and the environment at any cost to include the write-off of the reactor.

I will now pass on the presentation Dr. Rzentkowski.

DR. RZENTKOWSKI: Thank you very much, Mr. Jammal.

I would like to take this opportunity and on behalf of the task force thank Mr. Jammal for his continued support of the task force activities. Without his help we wouldn't have achieved what will be presented to you here today.

The Fukushima accident raised many concerns, both internationally and in Canada about potential dangers of nuclear power. During the course of the last year, a lot has been written about lessons learned from the accident and about steps, either taken or considered, to further enhance safety of operating reactors.

There are, however, some fundamental questions that in view of the public remain unanswered, namely; can a major nuclear accident happen in Canada; is the Canadian public protected from the consequences of a major nuclear accident; are Canadian reactors safer today than they were a year ago?

To answer these questions, this presentation will provide a relatively comprehensive description of the CNSC's response to the nuclear events in Japan, starting from a brief description of the Fukushima accident, and the activation of the CNSC emergency operating centre a few hours after the accident.

The presentation will describe the steps taken by the CNSC and the industry in response to lessons learned from the accident. It will also outline the actions taken by the CNSC to comprehensively address the recommendation of the CNSC Fukushima task force report and in the process engage the public and other stakeholders.

In closing, we request the Commission acceptance of the CNSC action plan. We believe that the CNSC action plan, once fully implemented, will make nuclear power plants and other facilities in Canada as safe as it can possibly be, and in the process restore public trust.

The March 11, 2011 Japanese earthquake and the ensuing tsunami caused enormous death and destruction to the northeast coastal region of Japan and triggered the nuclear accident at the Fukushima Daiichi site.

The earthquake as of magnitude 9 in the Richter scale and was the fourth-largest since 1900. The earthquake was centred offshore, approximately 175 kilometres from the Fukushima site.

The earthquake was followed by a major tsunami. Over 20,000 people lost their lives in that tsunami, and half a million homes were destroyed.

The nuclear accident at the Fukushima Daiichi site was the combined result of the loss of off-site power to the plant, which was caused by the earthquake, and the loss of both on-site power and the water supply because of the tsunami.

Following the earthquake, the units in operation shut down automatically as designed. The control rods were inserted into the core and the nuclear chain reaction stopped. Cooling system were placed in operation to remove the residual heat.

Off-site power supply to the plant was lost and emergency diesel generators started and powered the station emergency cooling systems. About 40 minutes later the station was struck by the tsunami that flooded the site.

The tsunami took out all multiple sets of the back-up emergency generators in Units 1 to 4. Reactor operators followed up normal and emergency operating procedures and were able to utilize emergency battery power to provide power for cooling the core for a few hours.

Once cooling was lost the reactor core in Unit 1, 2 and 3 begun to melt down. Unit 4 had no fuel in the reactor at the time of the accident. The fuel was removed to the spent fuel storage pool.

The reactors at the Fukushima Daiichi site are boiling water reactors. A cross-section of a boiling water reactor is shown on the right-hand side.

It can be seen that the reactor core is contained inside the steel pressure vessel, which is isolated from the environment by the primary and secondary containments.

It is important to note that the spent fuel pool is located on an upper level of the reactor building. This contributed to the consequences of the accident.

In simple terms, the sequence of the

accident can be described as follows; over-heated fuel in the reactor core reacted with steam to produce hydrogen. Hydrogen explosion destroyed the upper parts of the reactor building and damaged the spent fuel pool. The reactor core eventually melted through the pressure vessel and as a consequence, the primary containment failed due to combination of high temperature and pressure and hydrogen explosion in Unit 2.

Recognizing that over 20,000 people lost their lives in the tsunami and half a million homes were destroyed, the consequences of the nuclear accident were relatively minor. I would like to emphasize that there was no loss of life reported to date as a result of the nuclear accident.

The zoning of the evacuation areas around the Fukushima plant are slowly being redefined and some residential restrictions are being lifted.

The Japanese Safety Agency is also revising the temporary food and water restriction criteria that were initially put in place.

The mid to long-term plans towards the decommissioning of the Fukushima reactor units 1 to 4 are being put in place. It is clear that complete site restoration and clean-up will continue over the next 30 to 40 years and it will cost billions of dollars.

While major accidents such as the Fukushima accident happen very infrequently, it is very important that all nuclear facility designers and operators, nuclear regulators and emergency response organizations learn every possible lesson. Many lessons from the Fukushima accidents have already been considered and many more will emerge in the years to come.

Today, we would like to focus on the key ones only. First, the Fukushima accident demonstrated that absolute risk associated with the operation of nuclear power plant is real, no matter how robust the reactor design is.

Consequently, the accident reinforced the need for defence against severe accidents which are accidents beyond the current plans design capability by limiting the consequences, should one of these occur.

There is the need to consider extreme natural hazards in the siting and design of nuclear power plants. The evaluation of extreme hazards should be reviewed periodically for their impact on current plan configuration and on the future requirements for new builds.

Second, socio-political considerations play a consequential role in implementing an effective safety culture. Systematic problems were identified by the

Japanese regulator such as safety culture and independence of the regulator. The operator must have an effective safety culture embedded in every element of power plant operation while the regulator must have adequate independence, legal authority, competence and transparency to fulfil its mandate.

To summarize, the Fukushima accident demonstrated that reactors can be operated safely only by constantly recognizing their potential dangers and questioning all elements of their defence in depth that could potentially fail, including challenges posed by external hazards and human errors.

We learned that regardless how low the likelihood of an accident is, it can happen at any time. Consequently, the nuclear community, the operator and the regulator alike need to anticipate the unexpected in order to keep nuclear power reactors safe by looking back and beyond.

I will now place the lessons we learned from the Fukushima accident in the Canadian context, starting from external hazards.

In relation to seismic events, the figure on the left-hand side shows seismically active regions in the world which are generally located at the boundaries of tectonic plates. All Canadian nuclear power plants are located in the seismically stable regions, which is circled in red, where only low to moderate seismic activity can be expected.

The largest earthquake magnitude registered near any power reactor site in Canada is 6.2 on the Richter scale. This is almost 1,000 times lower than the March 11th, 2011 earthquake in Japan.

In relation to flooding, all Canadian nuclear power plants except for Point Lepreau are on inland bodies of water with no threat of tsunamis. They have provisioned to withstand severe flooding with no significant damage. Flooding risk is reduced by using engineering shoreline breakwaters, catch basins and storm sewers. The Point Lepreau Nuclear Power Plant is on the shores of the Bay of Fundy, where tidal water levels fluctuations of 40 to 50 feet are possible.

This is one of the external factors considered in the plant’s design basis.

In summary, all Canadian nuclear sites have been assessed for a range of hazards including seismic events and flooding and power plants have been licensed on the basis of there proven ability to withstand these events with no significant damage.

Therefore, the precise events that occurred in Japan are highly unlikely to take place at Canadian reactors sites in terms of the magnitude of an earthquake and a consequential tsunami.

This slide highlights some of the design features of CANDU reactors. As an example, a schematic of a CANDU-6 reactor is shown to give some highlights of the CANDU technology and its inherent design features that can be leveraged to prevent fuel failure.

CANDU reactors are designed and built to have reliable safety systems and multiple barriers to safeguard against the release of radioactive materials. CANDU reactors contain a large inventory of water, including the primary and secondary coolants, moderator, shield tank or dousing tank water, emergency coolant and other reservoirs.

CANDU reactors make use of steam generators that provide passive fuel cooling for thermal siphoning. As long as water is maintained in the steam generators, the fuel will be kept cool. There’s a possibility for gravity-fed backup water supply to the steam generators, either through the aerator or through the dousing water storage tank.

In the event that it’s not possible to maintain inventory to the steam generator, cooling of the fuel can be achieved by means of the low pressure moderator in the calandria vessel. As this water boils off, make-up water to the moderator will keep the fuel cool. Surrounding the calandria is the cold low pressure water in the shield tank or calandria vault.

This water will cool the calandria and for a period of time will prevent molten corium from exiting the vessel.

CANDU-spent fuel pools are seismically qualified with diverse means of adding water. As CANDU reactors use natural uranium, re-criticality is not an issue. Spent fuel is removed routinely to dry storage to minimize pool inventory. This minimizes the heat load and maximises the time for intervention.

The general approach to the development of regulatory requirements for nuclear power plants in Canada has evolved over the years in an effort to enhance safety of nuclear power plants here.

As a result of the National Research Experimental Reactor, NREx accident in Chalk River on December 12, 1952, a concept of dual failure accident analysis was introduced that required that the nuclear power plant be designed for a single dual system failure such as a heat transport system pipe break combined with a coincidental failure of a safety system such as a shutdown system. This led to the consideration of selected beyond design basis accidents, in the design basis of nuclear power plants in Canada.

This also led to the specification of design criteria for the safety and safety support systems such as separation, independence, redundancy and diversity requirements.

These systems were designed in two separate groups. A two-group separation approach was introduced to provide protection from common cause failures for site-wide events such as earthquakes, tornados and site floods. This involved qualification or protection of at least one of the two groups.

For localized failures, such as fires and internal floods, it involved separation by distance or barriers between the two groups of system.

CNSC staff realized, however, that even a well-designed and well-built system may fail. Therefore, a more probabilistic approach was introduced later to assess support system and human failures, in particular, whether the defences were sufficiently independent and whether the reliability of the safety functions could be maintained with a sufficiently high degree of confidence.

Also, the CNSC adopted some international standards to further strengthen the existing, largely deterministic regulatory requirements by the systematic application of a risk-informed defence in depth strategy complemented by the use of the probabilistic safety goals.

The objective was to maximize effectiveness of prevention and control measures of incidents and accidents at several engineering and procedural levels.

Recognizing the magnitude of the Fukushima accident and the need for the regulator to lead, advise and communicate with both the public and other stakeholders, the CNSC responded immediately to the accident, as discussed in the next part of the presentation.

On March 11, 2011, the CNSC activated its Emergency Operation Centre in Ottawa. On March 17, 2011, the CNSC directive was issued requiring all nuclear power plants licensees in Canada to review its initial lessons learned from the accident in Japan.

A similar directive was issued a few days later to other major nuclear facilities. All Class I facility licensees were requested to report on implementation plans for short-term and long-term measures to address any significant gaps.

On April 19, 2011, the CNSC task force was formed to evaluate operational, technical and regulatory implication of the accidents.

The task force consider available international reports on lessons learned and developed safety review criteria that were structured along the lines of defence in depth.

On July 28, 2011, nuclear power plant licensees submitted to the CNSC details on long-term actions and implementation plans developed in response to Fukushima accident.

On August 19, 2011, the President of the CNSC formed an external advisory committee that independently reviewed CNSC actions in response to the Fukushima event.

The task force final report and CNSC action plan were submitted to three rounds of public comments. The CNSC action plan was revised in accordance with the comments received and is being presented here today for the Commission acceptance.

All these activities will be discussed in detail in this presentation.

Immediately following notification by the IAEA about the situation at the Fukushima site, the CNSC activated its Emergency Operation Centre, which was staffed 24/7, to monitor the emergency, assess early reports and provide timely, accurate information to Canadians and to other Canadian government departments and agencies.

On the national level, CNSC staff

participated in inter-governmental discussions and assessed ongoing radiation monitoring across Canada.

CNSC site staff performed inspection of all nuclear power plants and other nuclear facilities in Canada to assess the readiness of mitigating systems.

These inspections covered seismic preparedness, firefighting capability, back-up power sources, hydrogen mitigation and spent fuel pool cooling.

On the international level, the CNSC actively monitored the situation in Japan and worked with its international colleagues to identify and take into account any relevant lessons learned and implications for Canadian facilities and to share and to validate information received.

The CNSC deployed an expert to the IAEA to aid the Canadian response and advise Canadian citizens in Japan that CNSC performs sourced calculations and enhance its public communications, which included daily information updates.

The CNSC website was updated daily to keep Canadians informed of the developments in Japan and any potential impact on public health and safety. In doing so, the centre worked with all sources of other global information.

The CNSC task force developed detailed

nuclear power plant safety review criteria to be used in the review of the safety cases and emergency preparedness of nuclear power plants and other nuclear facilities in Canada and as well as acceptance criteria for licensee responses to the regulatory directive issued on March 17, 2011.

In the process of formulating the safety review criteria, the CNSC task force considered all the applicable lessons learned from the Fukushima accident and reviewed selected international reports to ensure that all aspects relevant to Canada were addressed.

Effectively, the CNSC task force has subjected the Canadian nuclear power plants, the existing emergency response measures and the regulatory framework and supporting processes to a systematic and comprehensive stress test to evaluate means to further protect the health and safety of Canadians and the environment.

The review criteria were structured along the lines of defence in depth to reassess effectiveness of prevention and control measures of incidents and accidents at several engineering and procedural levels, and to reassess effectiveness of mitigation measures should an accident occur.

The review elements included station design for external hazards, impacts of beyond design basis events, severe accident management measures for beyond design basis accidents, including severe accidents, emergency planning and response, and regulatory framework and processes.

The review criteria exceeded regulatory requirements and expectations. They were developed to further enhance the safety case of nuclear power plants in Canada.

The CNSC safety review criteria are consistent with the approach taken by other countries to re-examine the mitigating measures to deal with extreme events. This will be discussed later in the presentation.

The safety review criteria were developed to essentially guide the licensee’s assessments of the capability to respond to external events of higher magnitude than have been previously considered.

The criteria were also intended to guide a staff review of regulatory framework and international activities in support of the nuclear safety.

For each review element, this slide describes the scope of the review of the capability of the nuclear power plants in Canada to withstand conditions similar to those that triggered the Fukushima accident.

First, reassessment of external hazards such as seismic, flooding and extreme weather events that could have an impact on station robustness. This includes specific issues related also to multi-unit events and spent fuel cores.

Second, systematic assessment of beyond design basis accident, which are accident outside the scope of postulated initiating events and accidents considered in the plant's design basis.

These accidents could potentially lead to a limited core damage. It is thus important to gain some insight into mitigating actions such as provision of emergency water and electrical power in order to minimize potential progression of events to severe accidents.

Third, reassessment of mitigation measures. In the unlikely event of a severe accident, this includes pre-planning and preparatory measures for severe accident management guidelines such as procedure and equipment modifications to facilitate procedure implementation and training for severe accident management.

Fourth, review of emergency management effectiveness. As one of the major lessons learned from events in Fukushima, including the on-site emergency plan and its interface with off-site emergency response including federal, provincial and municipal agency responsibilities, communication channels and roles and responsibilities of the decision-makers, and also cross-border cooperation with focus on international emergency preparedness and response.

Lastly, part of the CNSC task force mandate was also to review the existing regulatory framework and to develop recommendations as appropriate for potential changes to CNSC regulatory requirements, inspection programs and policies for existing CANDU stations and new builds.

The post-Fukushima review has examined events more severe than those that have historically been regarded as credible and their impact on the nuclear power plants. Based on this review, the CNSC issued the action plan to further enhance the safety of nuclear facilities in Canada and reduce the associated risk to as low as reasonably practicable. The action plan is presented here today for the Commission acceptance.

The CNSC task force examined the response of nuclear power plants to external events that may cause a prolonged loss of electrical power resulting in the operators not being able to maintain the reactor cooled. The focus was on the need to anticipate the unexpected and, consequently, the need for an integrated off-site response capability.

The CNSC task force has proposed changes to the design or procedures where gaps were found in order to eliminate or minimize their impact. Specifically, the CNSC task force made recommendations for strengthening reactor defence in depth, enhancing emergency response, improving regulatory framework and licensing, and enhancing international cooperation.

Overall, the CNSC task force concluded that Canadian nuclear power plants are safe and that the risk posed to the health and safety of Canadians or to the environment is small.

CNSC management accepted the conclusions and recommendations of the task force report. All recommendations were divided into two broader categories, technical and operational for the CNSC staff to implement, and regulatory for the Commission's approval.

The action plan with implementation timeline was developed following management direction and public consultation. All nuclear power plant site-specific actions will be implemented in short term by the end of 2012, in medium term by the end of 2013, and in long term by the end of 2015.

Recognizing that the Commission acceptance of the action plan is pending, these actions have already been included in the CNSC compliance oversight process to document the CNSC staff expectations and to accelerate the resolution of the recommendations made by the task force.

This table summarizes the 13 recommendations made by the task force along with the implementation timelines indicated in the management response.

As you can see, recommendation number 1 has short, medium and long-term deliverables since it comprises several tasks and phases such as detailed analysis and engineering towards full implementation.

I will now proceed with a detailed description of the actions and measures undertaken by the CNSC and the licensees to address the lessons learned from the Fukushima nuclear accident.

The licensee actions are currently focused on strengthening the reactor defence in depth. The following major improvements are being installed or examined.

First, capabilities to withstand prolonged loss of power and cooling, including provisions for make-up water capabilities for beyond design basis conditions. This includes assessments of additional means for water make-up to the steam generators, Calandria vaults and spent fuel pools, temporary connections for services, both electrical and water and provisions of portable backup power to critical loads and emergency response equipment.

Second, response to containment challenges, including installation of a filter containment vent system, installation of passive hydrogen recombiners to reduce hydrogen concentration and adequate relief capacity for beyond design basis events.

Furthermore, the licensees accelerated the implementation of severe accident management programs that includes specific provision for multi-unit and spent fuel events. The licensees are also assessing the robustness of spent fuel pools. This work includes evaluation of structure integrity of the spent fuel pools at temperature in excess of design temperature, and implementation of high capacity make-up water. Industry also initiated an assessment of instrumentation and equipment survivability under severe accident condition.

This slide illustrates some of the design improvements already in place or planned to be installed in response to Fukushima accident. The top two pictures show the emergency filter containment venting system that was installed at Point LePreau as part of the refurbishment work.

The system is seismically qualified and does not require external power source. It operates passively to relief containment pressure and the vast majority of fission products.

Other CANDU plants are also considering

installation of the emergency filter containment venting system.

The bottom left picture is to demonstrate that the route leading to the secondary control room where the reactor can be controlled in case of an external hazard is seismically qualified.

The bottom centre picture shows some of the emergency back-up equipment, specifically emergency power generator that can be placed in service following a common mode incident in the event of the total loss of power supply.

The bottom right picture shows hydrogen recombiners, referred as PARs, installed in the reactor building at the Point LePreau station, Bruce A Units 1 and 2, Pickering Unit 4, and Darlington Unit 3. These are or will be installed at all CANDU nuclear power plant stations on a priority basis to provide an additional line of defence to the existing hydrogen igniters.

PARs are passive devices to remove hydrogen and carbon monoxide under accident conditions. They do not require power or operator action, self-stat in the presence of hydrogen in the air-steam mixtures. They use heat of reaction to produce strong natural convection which mixes the containment atmosphere.

The licensee actions are also focused on enhancing the on-site emergency preparedness and response. The current priority is on securing emergency mitigating equipment and resources. This includes procurement and interim storage of emergency mitigating equipment, such as pumpers, and portable generators, and identification of other emergency facilities for emergency response equipment.

It also includes provision for temporary hook-ups for mobile equipment to essential plant services in an effort to ensure emergency power and makeup water in the case of station blackout and loss of heat things.

This work is underway. And for some sites emergency equipment has already been procured.
The licensee also requested to proceed with installation of automated real time station boundary radiation monitoring systems.

There's also regulatory effort directed on enhancing the offsite emergency preparedness and response. On the national level, revision of the further nuclear emergency plan is being considered with the objective of enhancing effectiveness and integration of emergency management. This includes consideration for establishing the mandatory frequency of national exercises.

On the provincial level, revision of emergency plans are being expedited with consideration for increasing the frequency of full scale provincial nuclear exercises. Also multi-unit accidents are being considered as part of emergency planning basis.

The slide shows also the current status of full scale provincial exercises. As indicated: New Brunswick Power conducted exercise intrepid in March, 2012, Bruce Power is planning to exercise Huron Challenge this fall, 2012 -- 2012 the exercise plan for spring 2015 in Quebec however, is subject to positive decision on refurbishment of the Gentilly-2 Station.

In the area of improving regulatory framework and processes the CNSC actions include amendments to Class I facilities regulations to include explicit requirements for submission of offsite emergency plans with licence to construct or operate a nuclear power plant.

Radiation protection regulations to define applicability of operational versus emergency dose limits during the post-emergency phases, and to prescribe radiation protection criteria for workers who receive occupational exposures during emergency. And also, key regulatory requirements and guidance documents applicable to operating reactors and new builds.

The CNSC actions include also potential amendments to power reactor operating licences to implement and maintain severe accident management program, accident management program, public information program and periodic safety reviews. The CNSC staff made good progress in addressing these actions. The omnibus project to amend existing regulatory documents will be presented to the Commission this fall following public consultation.

In the area of enhancing national corporation, CNSC staff initiated first steps to work more closely with other international regulators. CNSC staff held a meeting between all CANDU owner countries to share results of the CANDU stress tests and to determine areas of interest where mutual support can be offered in case of a nuclear emergency. A similar meeting was held with the U.S. Nuclear Regulatory Commission.

Also the CNSC task force selected similar initiatives, undertaken by a number of senior regulators and international organizations, for post Fukushima review to ensure that all elements being considered by international peers, and that are relevant to Canada, are included in the scope of the task force review.

Recently the task force noted that the results of the European Union stress test for CANDU reactors in Cernovoda, Romania are similar to those obtained from the safety review conducted in Canada, and did not reveal any gaps for future follow-up.

Furthermore, CNSC staff is proactively supporting the international atomic energy agency's initiatives in response to the events in Japan, and it's leading the preparation of the Canadian delegation to the extraordinary meeting of the convention of nuclear safety.

I will now explain how the CNSC task force recommendations apply to nuclear facilities other than nuclear power plants. As it was noted earlier in this presentation the CNSC directive to reassess the safety case was issued to all Class 1 nuclear facilities shortly after the Fukushima accident.

The review of the licensee submissions did not reveal the need for any immediate regulatory measures. No additional scenarios were identified by Fukushima reviews that would lead to significant releases of radioactive material to the environment.

For most facilities the review focused on potential improvements to emergency response to deal with extreme events, recognizing that some facilities remotely located, like uranium mines, have always had to plan to deal with a full range of emergencies.

The situation for the NRU reactor at Chalk River, which is operated by AECL, is slightly different from that described above. Since the NRU reactor was in the process of relicensing in 2011 the response from AECL on Fukushima was incorporated into the CNSC staff licence renewal reviews.

The appropriate Fukushima related actions were added to the licence and in NRU improvement plan in October 2011. These changes covered the relevant parts of the task force recommendations.

CNSC staff provided frequent updates to the Commission to inform the public first about the situation in Japan and then about the progress of the CNSC task force in addressing lessons learned from the Fukushima accident.

The CNSC's response to the Fukushima accident was subjected to independent reviews to assess its effectiveness. The president of the CNSC commissioned and external advisory committee, and also requested the Fukushima review as part of an international atomic energy agency integrated regulatory review service mission. The Committee and the Agency's report are publically available.

CNSC staff invited the public and other stakeholders to comment on the taskforce report and the action plan. There were three rounds of public consultation as shown on this slide.

The consultation included posting of the Commission member document on the CNSC action plan and

CNSC staff disposition reports of all comments received. Even though there were no changes of a technical nature made to the taskforce report and action plan all comments received were taken into consideration in finalizing these documents.

All members of the public and all other stakeholders who commented on the taskforce report and the action plans were invited to intervene in front of the Commission today.

The president of the CNSC established an external advisory committee to assess the organization processes and responses in light of the lessons learned from the Fukushima nuclear accident.

The Committee members reviewed the CNSC processes

including, the initial response to the Fukushima accident in connection with the rest of government and international organizations, and its interaction with the Canadian nuclear sector and its regulated industries.

They also reviewed the CNSC communications with affected stakeholders including governments and other nuclear regulators and the public.

The Committee assessed also the implications on the CNSC regulatory approaches resulting from the international response to Fukushima, such as international stress test and the IAEA action plan.

The Committee delivered its final report to the president of the CNSC on April 12, 2012. The Committee made nine recommendations pertaining predominantly to emergency management and communication with the public.

In their report the Committee concluded that the CNSC acted promptly and appropriately in the early stages of the crisis. The CNSC management accepted the committee conclusions and recommendations, and the CNSC action plan was revised accordingly.

This slide presents a summary of the nine recommendations put forward by the external advisory committee and maps them on the CNSC recommendations and actions.

It can be seen that the Committee recommendations center predominantly on improving communication domestically and internationally among regulators and the world association of nuclear operators, and the coordination and execution of offsite emergency drills to clarify roles and responsibilities between government departments.

Also the Committee recommended that the CNSC examines the area of human and organizational performance and clarifies its position towards nuclear facilities response to Fukushima events, other than power plants.

The external advisory committee recommendations complemented the action plan and in some instances minor changes were needed to the proposed actions such as additional wording to provide clarity. As shown in this table all Committee's recommendation with the exception of recommendation 5 and 8 are already directly associated with the task force recommendations and proposed actions.

Recommendations 5 and 8 are being addressed through regulatory oversight and CNSC improvement initiatives.

Recommendations 3 and 4 pertaining to emergency management are very similar to those raised by the IAEA integrated regulatory review service follow-up mission as discussed on the next slide.
The first international peer review of the CNSC response to the lessons learned from the Fukushima accident was the IAEA integrated regulatory review service mission completed in December of 2011.

The review found strength in the CNSC response which was found to be prompt, robust and comprehensive. A good practice was identified by integrated regulatory review service for other regulators to follow as cited on this slide.

Two recommendations and a suggestion were offered. It was recommended that a national assessment of offsite emergency plans be undertaken and that periodic full scale exercises are instituted.

A suggestion was offered that a peer review of the Canadian nuclear emergency preparedness and response be undertaken. All of these findings were directed to the Government of Canada as opposed to the CNSC.

The second international peer review of the CNSC response to the lessons learned from the Fukushima accident will be conducted this summer 2012.

The contracting parties to the convention nuclear safety at the fifth review meeting in April of 2011 agreed to have an extraordinary meeting in August 2012 to discuss lessons learned from the Fukushima Daiichi accident.

CNSC staff will play an integral role as the lead of the Canadian delegation in any discussions related to this extraordinary meeting. Shown on this slide is a list of major milestones leading up to the extraordinary meeting.

Please note that CNSC staff is currently in the process of drafting the national report which in about two weeks will be subjected to peer review by other member states.

The Fukushima accident demonstrated that the absolute risk associated with nuclear power is real no matter how robust the reactor design is.

It demonstrate also that reactor can be operated safely only by constantly recognizing their potential dangers and questioning all elements of their defence in depth that could potentially fail, including external hazards and human errors.

In conclusion I would like to emphasize several points. First, the events at Fukushima have highlighted the importance of nuclear safety around the world, and led all international regulators and licensees to review their readiness for external events.

As part of the CNSC response the CNSC Fukushima task force was created shortly after the accident with the objective of reviewing the capability of nuclear power plants in Canada to withstand conditions similar to those that triggered the Fukushima accident.

The president of the CNSC formed an external advisory committee to assess CNSC's response to events in Japan and requested the Fukushima review as part of an IAEA integrated regulatory review service follow-up mission.

The external advisory committee concluded that the CNSC acted promptly and appropriately in the early stages of the crisis.

The integrated regulatory review service mission identified the CNSC response as a good practice that should be followed by other regulatory bodies. Specifically the mission stated that at the CNSC, completed a systematic review of the lessons learned from the accident and made use of all the available information including the review of actions taken by other international regulators.

Second, the CNSC task force concluded that Canadian nuclear power plants are safe and that the risk posed to the health and safety of Canadians or to the environment is small.

CANDU design is robust and incorporated a strong defence in depth approach that relies on multiple layers of defence.

The reactor design already includes some of the beyond design basis accident scenarios in its design basis, and has design provisions that can be credited under severe accident conditions.

The CNSC task force has also verified that all Canadian nuclear power plants are located far from tectonic plate boundaries and that the threat of a major earthquake at the Canadian nuclear power plants that could lead to station blackout is negligible.

Third, the CNSC task force findings and recommendation will be put forward as needed to support the resolution of the integrated regulatory review service mission recommendations, and Canada's national report to the extraordinary meeting of the convention on nuclear safety.

Fourth, why no major changes to the Canadian nuclear facilities and the regulatory system have been identified the various findings from the CNSC Fukushima task force, along with the recommendation of the external advisory committee, the integrated regulatory review service mission and the public, were incorporated in the CNSC action plan.

The CNSC action plan reflects certain shift in regulatory focus from accident prevention to accident prevention and mitigation in order to effectively deal with highly unlikely events that traditionally have been considered as non-credible.

We believe that this is the only practical way to make nuclear power as safe as it can possibly be. Therefore the CNSC task force is confident that the improvements recommended in the CNSC action plan, once fully implemented, will further enhance the safety of nuclear power in Canada and will reduce the associated risk to as low as reasonably practicable.

Lastly, the industry's response to Fukushima accident was comprehensive and timely. The industry performed systematic reviews to identify gaps and opportunities for improvement and already made good progress in implementing safety upgrades. Many improvement plans are in place as a result of industry initiatives. OPG actions were highly rated by the World Association of Nuclear Operators.

To summarize the conclusion, it is important to stress that under the oversight of CNSC and its staff, Canadian nuclear power plants have been operating safely for over 40 years. As has always been the case, there will only be licence if the CNSC is satisfied that they will continue to be operated safely.

The last example is relicensing of the Point LePreau station which, in order to continue operation, was refurbished and modernized and now complies with modern international standards including those pertaining to beyond design basis accidents and severe accidents.

Today CNSC staff request the Commission acceptance of the CNSC action plan. Recognizing that the Commission acceptance of the action plan is pending, a number of actions have already been included in the CNSC compliance oversight process to document the CNSC staff expectations and accelerate resolution of the recommendations made by the task force.

As I mentioned earlier, the action plan will be amended as directed by the Commission.

Tracking of implementation will be monitored by staff via normal compliance verification. CNSC staff will report annually to the Commission on the status of implementation as part of presentations on the safety performance of nuclear power plants and other nuclear facilities.

To close my presentation, I would like to emphasize that the CNSC action plan as presented here today is not closed. Further lessons will continue to be learned and the CNSC staff will evaluate them to assess implications for Canadian nuclear power plants and other nuclear facilities, as information from Fukushima comes to light. When it comes to safety, we will never be complacent.

Mr. President, Members of the Commission, this concludes my overview of the CNSC and the Canadian nuclear industry response to the nuclear events in Japan.

Thank you very much for your attention. I will now turn over to Mr. Ramzi Jammal.

MR. JAMMAL: Dr. Rzentkowski. Mr. President, Members of Commission, I made an omission in my presentation of the Fukushima Task Force member staff. I would like to introduce to you Dr. Sanja Simic, who led the Severe Accident Management Review.

So for that I apologize to my colleague, and now we're ready to take any questions you might have. Thank you.

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

What I'd like to do is I would like to go through one -- kind of a quick first round of question, then have a break and then ask -- we'll hear from intervenors and then, at the end of all the intervention, we will have as many rounds as Commissioners would like to have until we are exhaust all our questions.

If that's acceptable, why don't I start with Dr. McDill?

MEMBER McDILL: Thank you. I'll begin by thanking the entire group for their efforts in putting this together.

I guess we all have a whole bunch of questions. I'll start. I'll come top down.

One of the things that I haven't seen here is a comparison to the other regulators, and I suspect that will come in time. But how does our report stand in terms of, for example, the United States, France, Sweden -- Germany we know a little bit about -- even given the difference in reactor designs?

This is one thing that I was looking for that I didn't see, so I'll start with that question.

MR. JAMMAL: For the record, it's Ramzi Jammal.

I will start with the high level answer, Dr. McDill, and I will pass it on to Dr. Rzentkowski.

As this report was being written up, we were ongoing comparison with other regulatory bodies, either through collaborations with them or through international meetings. With respect to comparison, the European Council report is out and has put -- it is public and clearly confirmed that the design of the CANDU is safe.

And if we go through the report, the EC report, which is the European Council report, they addressed exactly the same reviews that we have taken and overall, globally, every other regulators is taking now what we consider beyond design basis programs and being incorporated into the existing design basis.

So if you -- in layman's language, if you take design basis as a bubble, this bubble has been expanded to encompass beyond design basis activities.

The U.S. NRC has finally put in place a draft report. We have to be careful on the nomenclature being used by other regulators. There is -- they call it the flex report. Ours, we call it short term, mid term and long term. So in other words, each one is putting their own implementation according to their regulatory needs and to the industry response. And that's where we are from the international perspective.

I will pass on to Dr. Rzentkowski to add anything if he has.

DR. RZENTKOWSKI: Thank you very much for this question. It's really a sweeping question. It's not very easy to respond to it, but I think we have to respond at two levels.

First, the review scope. I think in this context, our review criteria are a little bit more comprehensive. The international review scope is specifically on the accident scenario which occurred in Japan, so that means station blackout followed by loss of heat sinks.

And for this particular scenario, the international focus was on identifying key effects, so that this kind of event is not going to lead to catastrophic consequences.

In our case, we took a step back a little bit. Knowing from the onset that, for example, a combination of a catastrophic earthquake and tsunamis is highly unlikely in Canada, we decided to expand the scope of the review and refocus on the design basis again, trying to find out if there is anything what can be improved in the design. Then we focused also on the broad spectrum of external hazards which exceed those which are normally considered being credible to identify any potential improvements for beyond design basis accidents and also to safeguard the plant against severe accidents.

This will be done predominantly through the implementation of severe accident management guidelines. And here the approach becomes very similar, between international and ours, as then it comes to identification of the concrete steps and implementation of these steps.

The steps identified. It was really interesting to find out for us because we took a different approach, but we come to the same point.

Second, in terms of the focus. The focus is on the practical improvements to further enhance the design basis of the plant and then making sure that any mitigation actions will be, in fact, fully effective; even taking them offsite and reassessing emergency management to make sure that it would be effective in the case of this kind of disaster.

So I know this was a very winded answer, but let me summarize it very briefly.

Our review scope was somewhat more comprehensive. The conclusions of the reviews are pretty much identical.

MEMBER McDILL: Will there be, at some point, a table that perhaps summarizes this for us?

DR. RZENTKOWSKI: Yes. As I indicated towards the end of my presentation, we'll continue reviewing lessons learned and I consider this to be one of the lessons learned; the outcomes of the reviews conducted by other international agencies.

At the moment, we compared ourself directly to the Romanian regulator because they just completed the study for the European Union and the list of the improvements identified there is very similar to what we recommended here.

MEMBER McDILL: Thank you.

And the shift from prevention to mitigation as part of the action plan, is that universal?

MR. JAMMAL: Ramzi Jammal, for the record.

That is correct, Dr. McDill. We took the lead on the shift from prevention and mitigation and balancing between prevention and mitigation. So the international community is going in that direction.

We have implemented in our action plan such measures. That means the -- if everything fails, what is the end point.

And the mitigation that we put in place is you will protect the public and the environment at any cost to include the availability of the assets on-site, off site and availability of the assets to be transported.

So the international community now has accepted the fact that at some point you will go into mitigation measures and you implement mitigation in order to protect the public and the environment.

MEMBER McDILL: I have other questions, Mr. Chair, but I'll pass it along for Round 1.

THE CHAIRMAN: Thank you.

Mr. Tolgyesi?

MEMBER TOLGYESI: Merci, monsieur le président.

Premièrement, je dois souligner l'effort et la promptitude du personnel de la Commission qui ont élaboré ce plan-là en fonction de certaines recommandations.

C'était quelque chose qui était rapide. Je pense que il est compréhensible, il est assez complet et il est évolutif parce que je pense pas que c'est quelque chose – fin en soi, mais c'est quelque chose qui va progresser.

J'aurais quelques questions -- I will have a few questions, maybe more technical.

And one of the strengthening reactor difference in depth, you are saying that cost benefit implications may be included in the rationalization of each action but will be subject to staff review and acceptance.

How this cost benefit implication and the rationalization goes together with the regulatory?

DR. RZENTKOWSKI: We define the objectives, what needs to be done by the licensee, and then the licensee design different design options to meet those objectives.

Now, in evaluating the different design options, we allow to use cost benefit analysis, but it doesn't mean that any point we relax our regulatory position, it's just to help the licensee to assess different means of meeting our expectations or requirements, but it's only one of the elements which is considered in the overall evaluation. It's not the dominant one by any means.

MEMBER TOLGYESI: There will be no shortcut or reducing preparedness or whatsoever?

DR. RZENTKOWSKI: I can assure you that definitely not. The objectives are already identified in our action plans and the licensees will have the freedom to select the options but there would be no shortcuts in meeting those objectives.

MEMBER TOLGYESI: And one of the recommendations number, I think it's number 7, you are saying that the CNSC should initiate a formal process to amend Class 1 nuclear facility regulations acquired to nuclear power plants licensees to submit off-site emergency plans.

Are the off-site emergency plans under the jurisdiction of the CNSC?

MR. JAMMAL: For the record, it's Ramzi Jammal here.

The intent of the regulatory amendment currently that we are asking or recommending the Commission to accept currently, we want to be very explicit with regards to the requirements for off-site. Currently such action is part of the licensing basis implicit and it's addressed through licence conditions.

To formalize the process we want to amend and we are requesting the amendments for Class 1 to encompass off-site emergency response and put our regulatory requirements where the licensee, the operators, the municipal will put themselves into the CNSC requirements that they will work towards the needs of the CNSC.

And I will pass on this -- if you require more depth from technical, I will ask Mr. Luc Sigouin to elaborate on this or Mr. Awilliwand.

MR. SIGOUIN: Luc Sigouin, for the record.

You're correct, Mr. Tolgyesi, the off-site emergency plans don't specifically fall within the jurisdiction of the CNSC. However, the recommendation was made based on the following logic that within the regulatory oversight and jurisdiction of the CNSC is the licensee's requirement to support off-site authorities in preparing and planning for emergencies.

In order for CNSC staff to make -- to review this, it was felt that it was required to have an explicit requirement to have the licensee submit the off-site plan so that staff can verify that the interactions and requirements of the off-site planning authorities are indeed addressed in the licensee's emergency plans.

This has always been done but has not been explicitly addressed within the regulatory framework, and this was to address that to make it a more formal and more explicit requirement.

MEMBER TOLGYESI: What will happen if there is a -- the CNSC does not agree with the plan? What could you -- what actions could you take that, to make sure that it's fulfilled?

MR. SIGOUIN: Luc Sigouin, for the record.

The actions that staff can take are leadership and coordination actions, not unlike what staff has been doing with the issues of public alerting in the Durham Region.

Ultimately, I think it is the purview of the Commission to make a decision on licensing a facility for operation or construction and the information or the evaluation of staff as to licensees in support of the off-site emergency preparedness plans would be included in our evaluation and could be considered by the Commission.

MR. JAMMAL: Mr. Tolgyesi, I would like to add a couple of things, is you're asking the question with respect to jurisdiction. The Commission has the right in order to put in our regulations our expectations in order to have in place an off-site emergency management.

We will ask and we will put two things, prescriptive requirements and performance requirements. The prescriptive requirements, that means the licensee must have in place an emergency plan that will encompass municipal and provincial and federal requirements, that means as they pertain to the CNSC for the protection of the public and the environment.

Now, you're asking the question is how do we do regulatory oversight. That will be -- the reason it will be in regulation so it will be an assessment against those requirements and those will be part of the licensing basis and the approval as we go forward with respect to performance of the license, the performance of the municipality or the local authority, or the stakeholders involved in the emergency management.

So the key point here is establishing and put in place the regulatory requirements that the CNSC expect as it pertains to the off-site emergency management.

THE CHAIRMAN: I think that's enough for one round.

Ms. Velshi?

MEMBER VELSHI: I have some questions just on making sure I understand the completeness of the action plan.

But before I get to that, Slide Number 6, on consequences of the Fukushima nuclear accident, isn't this rather incomplete?

We'll wait for it to come up. And while we're waiting for it, I guess my question is, there is no mention made -- yes, there's no acute doses that resulted in fatalities but there is no mention made of public doses and, you know, what we see increased risk to mortality as a result of that. And maybe you can just comment on that based on the information that's available.

DR. RZENTKOWSKI: I mentioned in the presentation that there was no loss of life reported to date, but of course there were certain doses received by both the workers and the public.

And in terms of following up on the development in Japan, I will ask Dr. Patsy Thompson to respond to this question.

DR. THOMPSON: Patsy Thompson, for the record.

The information that has been provided by staff today and in various reports does not specifically address the situation with members of the public or workers, simply because today the information is incomplete.

The CNSC is collaborating with UNSCEAR, the United Nations Scientific Committee on the Effects of Atomic Radiation, who are asked last year to establish a working group to assess the effects of the Fukushima accident.

And so that working group will look at all of the available information, the quality of that information, doses to members of the public, to workers, and the health effects that are expected from that accident.

So the -- I believe the timeline for production of that report is for the report to be submitted to the General Assembly of the United Nations in 2013.

MR. JAMMAL: I'd just like to add to this one, Ms. Velshi, is a couple things that we currently know.

Is we know that the limits for radiation protection are not adequate for the workers with respect to emergency response because to date the exposure to the public has been way within the health limits and that's one of the lessons learned -- that the community has learned with respect to the Fukushima incident.

As Dr. Patsy Thompson mentioned, that they'll be more information to come. However, to date, that the levels exposed -- the public got exposed to is within the health limit. The challenge is going to be on re-habitilation (sic), re-habitation and recovery phases.

MEMBER VELSHI: Thank you.

Moving on to Slide Number 20 on the action plan and the different timelines; as I was reading the specific action items -- and many of then to the licensees talk about -- you know, doing assessment, identify your gaps and submit your plan and schedule.

Is the timeline for them to submit the plan or is it to actually close the gap? So when it says -- you know, December 2013 is it actually to even fix the gap?

DR. RZENTKOWSKI: It depends on the specifics of the action but in many instances if is to finish the detailed safety analysis.

That's one step in the action. Then the second would be detailed engineering and final implementation.

So you're correctly saying that in 2013 predominantly will be to finish the engineering and implementation will happen afterwards.

We expect that implementation phase will be completed by the end of 2015. But nevertheless, that's what is now ready, where the design option has been selected, is being implemented as we speak.

MEMBER VELSHI: So we're confident that by end of 2015 all those gaps would be closed then?

DR. RZENTKOWSKI: I would like to respond with a high-level of confidence but this really will depend also on our interaction with the licensees because implantation of many of those upgrades would require probably, a prolonged shutdown of a unit.

So this has to be scheduled with some other activities at the site. So, you know, really the other issues may get into play, like for example the need for energy production in scheduling those longer outages.

So not quite sure but we will take any effort we can to make sure that the actions will be implemented by the end of 2015.

And I would like to emphasize again that annual updates will be provided to the Commission. So if we see that there is any action which can go beyond 2015 we will alert the Commission to this fact.

MEMBER VELSHI: Thank you.

Now, I know you did mention that this is a dynamic action plan, you know, and it'll change or get updated.

So this CNS meeting coming up in August where, you know, the different regulators are going to be sharing their lessons learned, do you see that as having a major impact on the action plan?

DR. RZENTKOWSKI: I see that as having an impact. A major, I don't know but definitely it will have an impact because we'll exchange international experience and will be peer reviewed by other member states on action taken or proposed.

So from that standpoint, this may reopen some other avenues for improvements.

THE CHAIRMAN: Thank you.

I misunderstood also, your timelines there. I don't -- the word "implementation" to me means "closed", unless -- so there's -- we will have to deal with these as we go forward and try to monitor -- I'm not interested in when the plan is done. I mean this is when the action is actually completed.

So you don't have to deal with it now but if you mean something else I'd like an estimate of closing time.

DR. RZENTKOWSKI: The overall plan will be closed in December of 2015.

And I'm sorry for this confusion but what you are seeing in front of you is really our compliance oversight program; that's what it is and that's why sometimes this is broken into phases, for better monitoring of the progress achieved by the licensees.

THE CHAIRMAN: But it's only Item Number 1 is closing date of 2015. All the rest of the 12 recommendation -- I read them to be closed by 2013. So we'll have to deal with this.

DR. RZENTKOWSKI: We'll have to deal with that but if you want a better answer I definitely can ask

Phil Webster who is our lead for the post-Fukushima compliance activities to respond to that question.

THE CHAIRMAN: Go ahead, very quickly, please.

MR. WEBSTER: Thank you, Dr. Rzentkowski.

Mr. Jammal said “not yet”, so I hesitated.

As you can see in Appendix D to the CMD in front of you, we have listed the Fukushima action items we’ve opened on the licensees, there are 36 of them.

And as Commissioner Velshi has pointed out, in some cases these refer to developing a plan and schedule rather than implementing the plan and schedule.

We did this because the FAIs, as we call them, apply to all licensees and what we’re seeking to do is close these as expeditiously as possible. We will then open station-specific action items for the implementation phase.

This is consistent with our traditional approach on actions that affect all licensees.

But let me give you an example of where something that’s already closed and being handled at the station level and that’s Fukushima Action Item 1.4, which is the plan and schedule to install the passive autocatalytic recombiners, the PARs that Dr. Rzentkowski mentioned.

We opened this because the work was already underway but the licensees have already produced new plans and we are now able to actually close the majority of these and we're handling these already by station-specific action items.

So I'm confirming here that this is a dynamic opportunity. We will update the table bi-annually, we'll report it to the Commission as often as we can and we will handle the ongoing implementation of the work via our normal compliance oversight process.

THE CHAIRMAN: Thank you.

Monsieur Harvey?

MEMBER HARVEY: Merci, monsieur le président.

Dans quelle mesure les entreprises ont été consultées pour établir votre échéancier?

Mr. JAMMAL

Pour l'enregistrement, M. Jammal. Dès le début, on a engagé l'industrie pour faire deux choses. Ça veut dire que la transparence et la capacité de l'industrie à mettre sur place des mises en œuvre à répondre à nos requises (sic).

Alors, on a établi notre plan d'action et puis on a engagé l'industrie et on a eu des discussions avec l'industrie pour que l'action ou bien le requise (sic) qui se trouve dans le plan d'action du personnel ne sera pas une surprise pour l'industrie.

Et la Commission canadienne était le (sic) premier, ou bien la première organisation règlementaire qui a engagé l'industrie dès le début.

MEMBER HARVEY:

Ce que vous proposez est quand même d'envergure, ce que vous avez réalisé est d'envergure déjà, et j'entendais le docteur Rzentkowski qui disait que ça prendrait peut-être des "outage" prolongés pour réaliser certains travaux, donc vous avez déjà en tête -- parce que j'ai un peu de misère avec l'effet que vous présentez toujours du côté de la robustesse des réacteurs Candus -- et déjà vous laissez entrevoir qu'il va y avoir des opérations assez importantes à réaliser, sujet aux études qui seront faites d'ici ce temps-là.

Juste pour me donner une idée, est-ce que dans les mesures qui seraient à prendre, déjà certaines de ces mesures-là ont été réalisées ou étaient prévues dans les projets de réfection?

Mr. JAMMAL

M. Jammal, pour l'enregistrement. Deux choses, je voudrais préciser. C'est le plan d'action, c'est la base réglementaire de laquelle on va établir et surveiller la mise en œuvre de ce plan d'action.

Le système canadien et le système de la Commission, on a toujours, toujours demandé des (inaudible) de permis de nous présenter chaque trois ans et puis on a effectué une révision du “safety case” de chaque installation, et surtout pour le prolongement des vies des réacteurs et puis un guide qu’on appelle “Prolongement de vie des réacteurs”.

On a mis sur place l'exigence réglementaire au niveau des normes internationales les plus rigoureuses et, pendant la réfection et surtout à Pointe Lepreau, toutes les réfections ou bien les travaux qui ont été effectués ont mis l'installation nucléaire et le réacteur à un niveau qui est égal et semblable aux requises et standards internationaux.

Et puis je voudrais laisser la parole à Monsieur Frappier s'il veut ajouter quelque chose d'autre.

M. FRAPPIER: Merci, Ramzi.

Gerry Frappier, pour l'enregistrement.

Comme vous avez dit, il y a des concepts qu'on aimerait voir, ou que l'industrie aimerait voir qui sont des travaux assez importants. Mais je pense que c'est aussi important pour -- et il y en a de ceux-là qui vont améliorer le système, mais le système avant était capable de -- I have to say it in English, sorry -- to handle -- to handle the safety problem that -- or the accident scenario that's being portrayed.

Some of these design changers are going to be things that are going to improve the ability to handle severe accidents and to mitigate situations such as the Fukushima accident, so that you have, as we talked about, steam generators that as long as there is cold water in them, there is an ability for thermal siphoning that will keep the reactor cool.

So they are going to look at improving ways where, if all else was problematic as far as all the different ways that we have of maintaining water in steam generators, they will be able to do some by bringing in outside equipment.

So that's a small change, but it is a change that's going to require effort of a design nature.

MEMBRE HARVEY: Merci.

Pour en revenir à ce que Monsieur Jammal disait, est-ce à dire que la centrale Pointe Lepreau n'aura pas à faire beaucoup de choses de plus qu'elle avait déjà faites?

M. JAMMAL: C'est ça. Alors, le plan de réfection, comme c'était déjà mentionné par Monsieur Frappier, prend en considération les analyses hors dimensionnement, "beyond design basic" qui ont déjà été mises sur place.

Alors, si on prend Pointe Lepreau comme exemple qui était révisée par surtout la Liste internationale des experts, alors ils ont mis sur place une amélioration au niveau de la ventilation, une ventilation filtrée. Alors ça, c'est une autre -- ça, c'est une amélioration qui a pris en considération hors dimensionnement.

En plus, comment dire, la “Severe Accident Management”, et puis le rapport de sûreté pour chaque installation qui va subir une réfection est révisé pour chaque étape, pour chaque système de sécurité, et surtout pour amélioration et le haussement de ce système de sécurité.

Alors, Pointe Lepreau a déjà mis sur place les améliorations requises qui dépassent franchement au niveau international beaucoup d'autres centrales nucléaires.

MEMBRE HARVEY: Merci.

Une dernière question rapide. Dans votre présentation, vous mentionnez les piscines de combustibles. J'imagine aussi que vous considérez l'entreposage à sec des -- parce que c'est pas mentionné là, mais j'imagine que c'est ---

DR. RZENTKOWSKI: Si cela ne vous dérange pas, je vais répondre en anglais?

MEMBRE HARVEY: Oui, pas de problème.

DR. RZENTKOWSKI: Merci beaucoup.

After approximately seven years in the spent fuel pools, the fuel is being removed to the dry storage. So dry storage hasn't been a part of our review, but the cooling in this dry storage, it's significantly -- the requirements for the cooling in dry storage are significantly less than for light-water reactors. It is simply because it's natural uranium fuel and because of that, the heat load produced, especially after seven years, is very low compared to the light-water reactors spent fuel.

M. JAMMAL: Juste pour préciser une chose, Monsieur le Président, je vais répéter en français ce que Monsieur -- Docteur Rzentkowski a présenté. C'est surtout dans les piscines, le combustible au Canada, c'est le combustible surtout usagé, c'est de l'uranium naturel. Alors, le risque de ce qu'on appelle "criticality", c'est tout à fait faible et non existant.

Et puis, la précision à faire ici, après le refroidissement, des grappes combustibles sont mises à sec et le refroidissement, c'est un refroidissement à l'air. Alors, on n'a pas besoin d'avoir d'eau pour maintenir le refroidissement.

MEMBRE HARVEY: Mais si ce combustible venait à être à l'air libre complètement, il y aurait un certain danger, j'imagine, Certaines radiations?

M. JAMMAL: Mais on a pris ça en considération surtout dans les mouvements de combustibles entre les réacteurs et les piscines. Est-ce que le combustible à l'air, après qu'il a été refroidi, est dangereux? Il n'y a pas une réaction nucléaire comme telle parce que c'est déjà refroidi. Alors, le combustible se trouve dans des endroits en béton pour, à ce moment, pour le blindage et la chaleur.

MEMBRE HARVEY: Merci.

THE CHAIRMAN: Dr. Barriault.

MEMBRE BARRIAULT: Merci, Monsieur le Président.

I'd like to go back to Recommendation 8, if I may, and amend the ***Radiation Protection Regulation***, and I guess I'd like to have a little more explanations as to which way do we want to go, up or down, in these recommendations.

I have concerns if we're going to move up based on the history of Fukushima. So can we ask for ---

M. JAMMAL: Je passe la parole à Dr. Patsy Thompson.

MEMBRE BARRIAULT: Merci.

DRE THOMPSON: Bonjour. Mon nom est Patsy

Thompson.

À ce qui a trait aux recommandations pour réviser les doses des travailleurs dans les règlements de radioprotection, ce qui faut dire c'est que présentement la limite de dose -- il y a deux doses qui sont mentionnées dans les règlements. Il y a la limite pour des conditions normales d'opération qui est de 50 millisieverts par année et 100 millisieverts sur une période de cinq ans.

Les règlements actuels prévoient aussi que, dans des situations d'urgence, que la limite de dose est de 500 millisieverts par année.

Alors, ce qu'on s'est rendu compte avec l'accident de Fukushima, c'est que même avec un chiffre qui est donné comme 500 millisieverts, il n'y avait pas beaucoup d'information puis de recommandations sur comment appliquer cette limite-là.

Donc, ce qui est proposé pour la révision, c'est de se baser sur les nouvelles normes de sûreté qui ont été mises de l'avant par l'AIEA en 2011 et ce que ça présente, c'est des indications, par exemple, 500 millisieverts ou plus quand il s'agit de sauver une vie humaine et de prendre des mesures pour arrêter un accident.

Il y a, par exemple, une autre indication de 500 millisieverts par année pour -- si les travailleurs ont à prendre des actions pour éviter des effets aigüs sur la santé du public et des effets à long terme. Et il y a une limite qui est spécifiée de 100 millisieverts quand les travailleurs prendraient des actions pour éviter une dose à un grand groupe de personnes, par exemple, des membres du public.

Donc, dans la révision, c'est de donner plus d'information sur l'application de la limite de 500 millisieverts et c'est tout à fait aligné avec les recommandations internationales de 2011.

MEMBRE BARRIAULT: Si on vient à ces recommandations-là, est-ce que ça va passer par la Commission -- les tribunaux?

DRE THOMPSON: C'est le processus habituel de révision des règlements, donc, oui, ça va passer par la Commission et, présentement, il y a un document en discussion qui est en revue interne.

La prochaine étape, ce serait que ce document de discussion-là serait publié pour commentaires externes et, par la suite, on présenterait des recommandations à la Commission pour rédiger le règlement.

MEMBRE BARRIAULT: Merci. Thank you.

My next question is a little bit outside of, I guess, the recommendations and I know we're dealing with recommendations. I don't see anything in moving forward that we're going to have minimum criteria for new reactors; in other words, are we going to request that they all be built underground, for example, as aboveground, or are we going to look at minimum criteria that you have to have in order for us to even look at licensing?

DR. RZENTKOWSKI: We are revising the regulatory document RD-337 which defines the design requirements for new power plants. And absolutely, in order to put a proposal forward, the applicant has to comply with this particular document, and this document will be addressing all actions learned from Fukushima.

MEMBER BARRIAULT: Okay. Thank you. Thanks, Mr. President.

THE CHAIRMAN: Okay. I think it's a good time to break for 15 minutes. We'll reconvene at 11:30. Thank you.

--- Upon recessing at 11:14 a.m./
L'audience est suspendue à 11h14

--- Upon resuming at 11:32 a.m./
L'audience est reprise à 11h32

THE CHAIRMAN: Okay, can we get going, please?

So just to remind everybody that we are allocating 10 minutes for the oral presentation and then there is no time limit for the questions. So please stick to the 10 minutes timeline.

And the first presentation is from Canadian Standard Association as outlined in CMD 12-M23.1 and 23.1A.

And I understand that Mr. Doug Morton will make the presentation. Please proceed.

12-M23.1 / 12-M23.1A

Oral presentation by the

Canadian Standards Association

(CSA Group)

MR. MORTON: Thank you, Mr. Chair.

I'd like to just thank the Commission for the opportunity to speak on behalf of CSA Group and particularly the Standards Organization.

I'm joined this morning by two individuals. Mary Cianchetti is our Program Manager for Energy and Utilities, and Mary is sitting next to me here, and she's responsible for the Nuclear Standards Development Program at CSA.

We’re also joined by John Froats. John is the Associate Professor and Nuclear Engineer in Residence at the Ontario Institute of Technology, and he is also the Chair of the CSA Nuclear Strategic Steering Committee.

The purpose of our presentation is to really provide a sense to the Commission of where CSA fits with respect to the nuclear regulatory framework, talk a little bit about what we’ve done in terms of responding to some of the items with respect to the Fukushima incident and also talk a little bit about the approach that we’re working on with respect to developing a framework for an emergency management standard.

Briefly, just to give you a bit of background about CSA, we are a not-for-profit organization. We’re accredited by Standards Council of Canada, which in turn reports to Industry Canada.

We have a philosophy of developing standards on a consensus basis with balanced representation from various stakeholders.

And the main driver and motivation for CSA’s existence is really to help promote public safety and health and welfare, quality of life, protect the environment, and also, through our standards facilitate trade, both domestically and internationally.

I’d also like to point out that CSA

standards are always voluntary unless adopted into legislation or regulation.

And one of the things that we pride ourselves on, based on the approach we take to developing standards, is our process is always transparent, and we also pride ourselves on being predictable. We develop very good standards based on multiple stakeholder input.

We also have a process where we are obliged to review our standards anywhere between three and five years so they're always refreshed and always take into account the latest in technology and processes.

With respect to the nuclear program in particular, we have 30 multi-stakeholder committees with over 400 volunteers, and I would point out that almost a quarter of those volunteers are CNSC staff. And so we thank the Commission for their on-going dedication to the development of standards.

We also have, as part of those stakeholders, again government, owner/operator, suppliers, folks from the service industry, et cetera.

In the standards program we have just a little over 40 standards that all take -- are all part of the nuclear framework that's responsible to the CNSC.

The average time to publish a standard is about 20 to 24 months but we have developed standards in seven or eight months, and a large part of that depends upon the availability and the time that our members can give us.

So we have a very strong track record of getting things done quickly, and again, we can speed that up depending on member availability.

In terms of the nuclear standards, CSA has been developing nuclear standards for over 30 years, again using experts from across the country, again promoting the safety of Canadians.

Our standards again represent the technical requirements for compliance with regulation. The regulations define what needs to be done. Regulatory documents and our standards define how they will be done.

Our standards are referenced in licences and licence compliance handbooks of the operating facilities across the country, and again we -- our standards form an integral part of the regulatory framework.

In terms of our response to Fukushima, we've provided CNSC staff management with an outline of the approach that the Strategic Steering Committee took in evaluating the reports that were made available to us with respect to our standards in the nuclear sector.

We've completed an initial review of those standards to -- based on CNSC and WANO action notices and industry responses. And the conclusion of the Strategic Steering Committee at CSA is that our current standards are robust and again continue to contribute to the safety of operating plants and Canadians.

There have been throughout that process, however, a few areas where we think we can go further and improve the standards that we have, and one of them that has essentially been touched upon a number of times this morning is this whole issue of emergency management. We think that’s an area that we should be working on more fully and I’ll explain that in just a few minutes.

With respect to emergency management, CSA has a strong track record in this particular field. About two and a half years ago we introduced the first national standard on emergency management and business continuity. We developed about a year and a half ago the first standard related to CBRNE attacks, are primarily aimed at the safety of first responders. We’ve also developed security standards for pipeline with organizations like the National Energy Board. And we’re currently working with organizations like the EMS chiefs and the Paramedic Association in Canada developing specific training in emergency management standards framework for those particular professions.

So we build upon that expertise to develop the framework of standards that could be utilized in the nuclear sector and that would also take into account the various regulatory requirements of various levels of government in the field of emergency management.

So in summary, and with this it's been very brief, again our standards compliment nuclear regulation and provide a consensus based solution with balanced input from a variety of stakeholders.

The Nuclear Strategic Steering Committee is addressing the Fukushima incident within its programs and any lessons learned will be built into that program and considered by the Strategic Steering Committee and built into the program going forward in terms of where improvements can be made to the robustness of our standards.

And with respect to the specific issue of a nuclear emergency management standard, a proposal will be made to the Strategic Steering Committee by June of this year, which will then be taken into account by the CNSC staff.

So that's the end of our presentation. I thank you for the time to talk a little bit about CSA and I would now welcome any questions.

THE CHAIRMAN: Thank you.

Who wants to go first? Dr. Barriault?

MEMBER BARRIAULT: Merci, monsieur le président.

I'm really interested in the standard for emergency management, and it seems to me it's one of the areas we've identified more or we're talking about licensing of nuclear plants, that we have a problem with what ends at the fence line and what goes on beyond into the community and into the provinces and the different level of jurisdiction.

So you mentioned a while ago that you could come up with standards in a short period. What would be a timeline for developing standards along this?

MR. MORTON: Again, Mr. Commissioner, it would all depend largely on the availability of our members.

One thing I should point out is CSA itself does not write the standards. We facilitate the process, we manage the process through our accreditation program with Standards Council but, again, the timeline would be largely dependent upon the availability of our members.

Now, in terms of the emergency management standard that's being considered and will be presented to the strategic steering committee in June, one of the issues the committee will have to consider is where does that fall in terms of their existing priorities. And again, depend on the priority and depending on the availability of the members, will dictate the length of time. So we will be in a better position to respond to that probably in June.

MEMBER BARRIAULT: Thank you.

Thank you, Mr. President.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: Thank you.

So the CNSC's action plan that has got a TCD of, I think, December of 2013 to have this standard in place, what you're saying is that you can't confirm that today.

MS. CIANCHETTI: For the record, my name is Mary Cianchetti.

That's correct. So we have a project charter in place that'll go in front of our strategic steering committee. They will determine the timeline.

I could say that we have published nuclear standards within seven months. That example was CSA N-290.15, on safe operating envelope. We know it's possible, but our average is 20 to 24 months.

MEMBER VELSHI: My second question is on slide 6.

You said you identified a number of future projects with the emergency management standard being a priority consideration and I guess for your stakeholders and for industry were trying to get a handle of what's this full package of work.

Can you shed some light on what these other future projects may be?

MS. CIANCHETTI: For the record, Mary Cianchetti.

So they identified three primary areas, emergency management being the top priority, but they also identified definition of beyond design basis accidents, severe accident management guidelines and source term calculations, so definition of multi-unit events and extreme events, as an area that we need to produce standards on.

MEMBER VELSHI: Thank you.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Merci, monsieur le président.

We've got standards and we've got the regulation. I just wonder if the standard is established to fit with regulation, or the regulation is established to be consequent with the standard because the standard, as I understand, is a consensus. So being consensus, it's mid-term between what could be done and what will be done, so ---

DR. RZENTKOWSKI: That’s correct. Thank you very much for this question. This requires clarification.

Definitely those standards are consensus standards. The CNSC staff reviews those standards and decides if they should go into our regulatory framework. And if we decide that, yes, they should go into the regulatory framework, we amend the operating licences by referencing those in pertaining licence conditions. So this is the process.

We have also another way that we can select only certain parts of the standards which we like and we can reference the standard as a licence condition, but then in the licence condition handbook we or define the applicable part of the standards.

So this is the process to bring Canadian Standards Association standards into the regulatory framework of the CNSC.

MR. JAMMAL: Monsieur Harvey, I’d just like to add a couple of things as we -- from a regulatory perspective. I’m not pretend to be a lawyer, but from -- we have the Act, we have the regulation and licence conditions.

And the standards at times complements the regulations because at the CNSC, we -- our regulations is based on -- some of it is prescriptive, some of it is performance based.

The performance base is that's where we use the standard as -- from enhancement of performance based as a common denominator where the licensee can meet it or exceed it.

And once we make reference to the standard in our regulations or in our licence conditions -- but we refer to them in our licence conditions. So then you are extracting from the standard what is applicable to complement the regulation because it’s not the whole standard at times. It’s either applicable to the site itself, or to the regulatory requirements.

MEMBER HARVEY: How would you compare a standard with the -- let’s say, the ALARA practice?

MR. FRAPPIER: Gerry Frappier, for the record.

I think -- we work extensively with the CSA in ensuring that standards are acceptable from a technical perspective. I think the CSA -- and they can speak for themselves, but they’re interested in having standards that are going to be used.

As Dr. Rzentkowski said, if we’re not happy with the standard, then we will not recommend that it would be used in a regulatory area.

So -- and we participate in the production of standards so, from that perspective, we are bringing an ALARA-type view to the table. Industry is interested in having consensus-based standards that can then be used because obviously they get to have their input into it, but if it's not meeting the requirements of the Commission, then we would -- we could write our own regulatory document that will bring in technical requirements or, as Dr. Rzentkowski said, we just -- we will not reference that standard in our regulatory framework.

MEMBER HARVEY: So sir, you want to add something? You have a comment?

MR. MORTON: No. What's been said -- Doug Morton, sorry, for the record.

What's been said is completely accurate.

MEMBER HARVEY: Thank you.

THE CHAIRMAN: Dr. McDill?

MEMBER McDILL: Two questions that I'll -- you can both answer, please.

Where is the United States on the equivalent standard? I mean, CSA sort of ends at the 49th most of the way across the county. So that would be the first question.

And to staff, in terms of emergency management, the regulations will have to expand to include our neighbours to the south, presumably, and First Nations who straddle both countries.

Can we start with CSA, please?

MS. CIANCHETTI: Mary Cianchetti, for the record.

Part of the CSA standards development process is to first benchmark against international practice to see if something -- if something already exists that we could use, we will use it. We will not duplicate effort, and that's part of our accredited process.

So if there is a U.S. regulation or standard that we can use, we will simply just reference it, adopt it or provide deviations for Canada's use. But because we have unique technology in Canada, we need to have Canadian standards.

MEMBER McDILL: So you don't know if an existing standard exists in the States.

MS. CIANCHETTI: We always do research first, and we ---

MEMBER McDILL: Yes.

MS. CIANCHETTI: --- always benchmark.

MEMBER McDILL: Yes. At this point in time, you don’t know.

MS. CIANCHETTI: Correct.

MEMBER McDILL: Okay.

DR. RZENTKOWSKI: This is a definitely very difficult question because first we have to resolve our problems at the multiple layers of the government here in Canada, and then we can look across the border and see how we can bring U.S. into this discussion. And First Nations, definitely they deserve to have a place around the table as well. So it’s a challenge. It’s definitely challenging from the logistics standpoint.

I would like Mr. Raoul Awad, who is the Director-General of Directorate of Security, to respond to this question.

MR. AWAD: Thank you very much.

We have our own regulatory document which is used now for the emergency management. It’s the G-225. And we are now revising this document to put it as a new regulatory document with high level requirement to allow the CSA to develop the sub-tier document, which is how to apply and how to comply with this new requirement.

For the consultation, all the document that either the CNSC or CSA put in place or work on it, they are subject to public input and public review, and both process in CSA and CNSC have this opportunity for the public input.

Thank you.

THE CHAIRMAN: Anybody else?

I am very intrigued by your offer to deal with emergency planning because one of the observation post-Fukushima everywhere is emergency planning is the issue. Can you imagine trying to coordinate emergency planning in Europe or nuclear multi-countries, et cetera?

So I'm trying to understand. Did you mention that you already have done emergency management standards for another sector?

MR. MORTON: The emergency management standard that we introduced about two years ago is a management standard and it's called Emergency Management and Business Continuity and it's specifically designed for emergency management situations in Canada.

So yes, it is a framework management structure that any sector could apply. We have specifically designed standards related to, for example, in the oil and gas sector, we did a security -- a pipeline security standard, but that's aimed very much at that particular sector, but the general framework standard that we go by is our Emergency Management and Business Continuity Standard.

THE CHAIRMAN: But even there, let's say for the oil company particularly, I assume you would have to get all levels of governments involved, would you not?

So maybe now is a good time to introduce our emergency planning people? I understand there's somebody from Emergency -- Public Emergency Canada -- Public Safety Canada, sorry.

Did you ever consider doing as a standard that the Public Safety community looking at the federal level or maybe the provincial level?

And before we get into this, so did you get all the parties together into one room and try to get a consensus on how to management emergency planning?

MR. MORTON: Yes. In fact, Public Safety Canada was a major contributor to the development of that standard, but we had provincial and municipal participants on the Committee, yes, sir.

THE CHAIRMAN: Public Safety, would you like to comment? Will you apply for -- will you apply in the nuclear field?

MR. OLDHAM: Craig Oldham, from the Government Operations Centre.

Within public safety, evolving right down from the *Emergency Management Act*, which gives the Minister of Public Safety the authority to scope out how planning is done and it also tells other ministers that they must have emergency plans in place in order to meet their mandates.

Within the Government of Canada, there is the Emergency Management Planning Guides; there is a mitigation strategy; there’s a federal emergency response management system, a federal emergency response plan and cascading out of that are things like the National Emergency Response System which deals with provinces and territories. So there is a whole triangle of emergency management plans and structures and governance in place.

Certainly, work has been done with the Canadian Standards Association, but in terms of planning for nuclear events in particular, that is principally Health Canada through the Federal Emergency Nuclear Plan. And we have colleagues here who can speak in more detail to that.

But even for a large-scale emergency such as Fukushima, it's not simply just that plan. There are many other aspects that come into it. There's a continuity of government potentially. There are order issues. There's law enforcement issues. There's international aspects to this. All these things fall under the Federal Emergency Response Plan which is the overarching Government of Canada plan.

And then there are supporting plans such as the FNEP and others which then feed into and support that plan.

THE CHAIRMAN: We understand how complicated it is. What is the solution?

MR. OLDHAM: That is the solution. And it's not as complicated as perhaps it appears at first. The Federal Emergency Response Plan and the structure that's in play there operates on a daily basis for all manner of emergencies. It's intentionally an umbrella sort of piece which includes a governance structure that did not exist back before 2003.

So even before the event in Japan that you're speaking about today for Fukushima, for the Government of Canada there were actually five different events that went on there. There was the earthquake overseas; there was the tsunami overseas; there was the potential tsunami in Canada, there were radiological issues overseas and there were radiological issues as they pertain to Canada and Canadians.

So all those pieces did have to be brought together, and that was done under the umbrella of the Federal Emergency Response Plan with that governance structure in place. So you're right; it is complex. There are multi jurisdictions and, you know, if you walk -- as you're all well aware, if you walk out from the onsite to the offsite, to the provincial responsibility, to the federal responsibility, to the international interactions that have to happen, it is complex.

But that's the reason that the Federal Emergency Response Plan exists and that's why there's an organization like ours to help bring that all together and provide, hopefully for the Government of Canada, a seamless and homogeneous response to an event such as that.

THE CHAIRMAN: Health Canada, you would like to comment on this?

MR. AHIER: Thank you. Brian Ahier, for the record, from Health Canada.

I'd like to -- I can add some information to this from the point of view of our role and responsibility for maintaining and administrating the Federal Nuclear Emergency Plan. I think, as Public Safety has said, there is, I should say, a hierarchy of plans in Canada which reflects the tiered nature of jurisdictions for emergency preparedness response.

The idea of the plans and the arrangements in place is to ensure that the response is effective and takes place within that in a timely manner.

So we would rely, of course, on the planning documents and procedures that are elaborated by

Public Safety because they're intended to provide an overall framework, an all-hazards framework for the Government of Canada and for other jurisdictions.

But with respect with specific standards for nuclear emergency response, we also take into consideration the standards and guidance that are produced by the International Atomic Energy Agency which are based on many years of experience, based upon international best practice and feedback from exercises and response to specific emergencies.

So when we have developed the Federal Nuclear Emergency Plan, we have taken into consideration specific standards from the IAEA that deal with nuclear emergency management.

And actually, with respect to the Canada/US relations, we also have partnerships with various departments -- I don't want to speak on behalf of the CNSC, but I know there are links between the CNSC and the US Nuclear Regulatory Commission. Health Canada has linkages with the US Department of Energy in terms of cross-border cooperation and Public Safety also has some arrangements in place.

Within the FNEP umbrella, the Federal Nuclear Emergency Plan umbrella, we also have a series of committees at the federal/provincial level as well as the interdepartmental level that allows us to provide some view on coordinating arrangements.

So it allows us to take into consideration the guidance and standards that do exist and to apply those and to move towards improving the coordination based upon those.

THE CHAIRMAN: Okay. Ontario, would you like to add anything to this?

MR. MORTON: President Binder, it's Michael Morton from Emergency Management Ontario. I'm joined by Dave Nodwell and Kathy Bleyer with our Nuclear Planning Department. I'll speak directly to the question related to national standards and the role of the CSA in standards.

Emergency Management Ontario has participated in the CSA standards development process over the last years and has been a member of the CSA Z-1600 Technical Committee to work on developing a national standard for emergency management in Canada.

And as was noted by the CSA representative, the standard is now in place and used widely by emergency management jurisdictions across the country.

Specific to Ontario are mandatory programs that are closely aligned with the CSA Z-1600 standard and many aspects of our Provincial Nuclear Emergency Response

Plan are also consistent with standards outlined in the CSA document.

In terms of a standard for offsite response to a nuclear incident, Emergency Management Ontario would be very interested in participating in any discussions associated with development of a voluntary standard for offsite nuclear emergency management, offsite nuclear response while also recognizing and noting, though, that the Province of Ontario does have a distinct legislated mandate to lead offsite emergency management arrangements for nuclear emergencies that might occur at facilities within the Province.

We believe that as an organization and as a province, we are well positioned to do that, but would be very keen to engage in an alignment of those standards, not just across Canada, but as one of the Commissioners represented earlier, alignment with standards in countries such as the United States. That is very much the case with the CSA Z-1600 emergency management standard, where it closely paralleled the national standards in place in the United States.

So in conclusion, certainly an area of endeavour that Ontario would be very interested in participating on and further discussing in the near future.

Thank you.

THE CHAIRMAN: Thank you. Thank you all for this intervention.

I think it's -- I think there's some suggestion that staff may pursue this. It'd be interesting to see if we can actually get a consensus on this.

It seems to me that the lesson for Fukushima was that -- there's two lessons here; there's always complexities, multi-jurisdictional hierarchy. The problem with nuclear is you can't wait. For the first 24 to 72 hours you've got to be absolutely crystal clear who does what inside the fence and outside the fence.

And I think that this is something the public would stand from fresh eyes and fresh look so -- and we would love to see if you can do it in seven to eight months, that would be very interesting.

Staff, what's the word on this?

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

We have nothing else to add, Mr. President, except we will be working closely and put in place the standard with respect to emission measurements so we can have all the players around the table.

As it was mentioned by Emergency Management

Ontario, the legislative mandate that they don't have and that's why we were recommending for Class I amendments in order to put the prescriptive requirements and everyone else will meet it from that perspective.

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

MR. MORTON: Thank you, Mr. Chair.

THE CHAIRMAN: The next presentation is from Marchhurst Technologies Corporation, as outlined in CMD 12-M23.2.

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

MR. PERLEY: Yes, good morning, Mr. Chair and Members of the Commission, I'm ready to go as soon as you say start.

THE CHAIRMAN: Go ahead, please.

12-M23.2

Oral presentation by

Marchhurst Technologies

Corporation

MR. PERLEY: All right, well thank you for the opportunity to present today.

I am the President of Marchhurst

Technologies Corporation out of Ottawa and Workplace Technologies Corporation, based on Long Beach, California.

Both companies are a small strategic technology planning and management consulting firms. We work in transportation, communications, defence and in part of the time in the emergency management sector. We've been in business about 22 years. I'm speaking to you today from southern California.

You have a detailed intervention document but I would like to mention certain points of this. First of all, I also would like to add that during the 1980s I was responsible for running the project which designed the original Point Lepreau offsite public warning system.

More recently our company has been directly involved in a series of activities for the New Brunswick emergency management organization, NB EMO, hurricane and nuclear threat assessments; working with evacuation planning methodologies and tools, revision of the evacuation plan.

We also undertook warning system assessment and benchmarking against seven other nuclear plants in North America, coverage estimates and proposals for improvement to the warning system.

All of that work I just described was in fact the first such project of its type done in North

America since Fukushima occurred.

I want to add though, and for the record state, our presentation is on our own behalf, I'm not representing or speaking for NB EMO nor NB Power today.

Our belief is that the action plan needs more work in terms of public safety and particularly public warning.

Can everyone hear me okay by the way?

Can you hear me clearly?

THE CHAIRMAN: Yes we can. Go ahead, please.

MR. PERLEY: I'm having trouble hearing you.

MR. LEBLANC: Yes, we can hear you very well. Thank you.

MR. PERLEY: Very good. Thank you.

During the 1980s I ran of series of projects which collectively became known as the National (inaudible) Warning System Program funded by the federal government, in those days called Emergency Planning Canada.

We were developing a multi-component public warning system which was intended to be nuclear survivable. Its core components included a computer-controlled or smart sirens, inverse use of street lights, turning them on in the daytime, off at night; indoor warning device, similar to a smoke detector to be controlled by radio or cable or some more signalling would activate during an emergency.

There was extensive U.S. collaboration with this program between Canada and the U.S. Interest was taken in other places, including the U.S.S.R. which conducted continual espionage against the program.

The program was terminated in 1984-5, by the Mulroney government. Key concepts though that arised (sic) from the program were a formal warning system -- morning cycle definition; the need to have multiple components in a system; measuring person outdoor hours where you place sirens and to get away from the fiction that sirens cover people indoors, which they do not.

Monitoring the actual personal activity modes that people are in as you assess the coverage of a warning system developing one that is what we call six nines or 99.999 percent available.

More recently I ran a project for Alberta which updated their warning system design and led them in the direction of a renewal of their warning system.

A lot of work is being done right now on cell phone alerting and people sometimes call it a panacea for warning but it’s not. If cell phones were designed to be a warning system you would not be able to turn them off or turn down the ringer.

If I want to reach you by cell phone you need to have a charged battery, you need to have your system turned on and it needs to have the ringer or vibrate activated.

If any one of those three things is not true cell phones are useless as a warning device.

I'm a member of the U.S. Nuclear Industries Alerting and Notification System Working Group which is currently in coordination with FEMA, working on the revision of what's call FEMA Rep 10, which is the national standard that they have for warning systems at nuclear power plants.

Note that I say "National standard", Canada does not have such a national standard.

Also in the U.S. we've been working with FEMA on various things and they've recently adopted our composite system -- composite warning system, builder guide at no cost to them as part of their national training program.

My view is that in Canada, although we worked on Canadianizing the common alerting protocol that there has been very little done in terms of national leadership, other than produce PowerPoint.

There’s a huge leadership vacuum in this country which has extended over 25 years. Each province and territory is going its own way with respect to public warning.

Industry Canada, which ended up inheriting the mandate for this from DOC, from the old Department of Communications, has focused mostly on broadcast and carrier-type warning systems and has studiously avoided sirens and anything else that’s not related to spectrum.

That’s an incomplete view of what a warning system should be. I believe the key issues for nuclear power plant offsite warning are that we need national standards.

I believe that some of the work which we did originally back in the eighties and more recently at Point Lepreau provide the basis for prototype for a new national standard and one which is required.

Whereas it appears from the record that over the last -- more than two decades, Public Safety Canada has been unwilling or unable to provide leadership in this area.

I believe that CNSC should do several things. First of all, convene a national composite warning system forum focusing on but not just limited to nuclear power plants.

Secondly, and I'd follow-up what was said in a previous presentation, lead the push towards national standards for public warning systems.

I provided you, in the -- in my intervention document a series of best practices based on my experience over the last 30 years with respect to public warning systems in Canada, U.S., and Europe and elsewhere, which was provided to you at no cost or obligation.

And I believe with respect to what was said by Dr. Jammal and by Luc Seguin earlier, you need to be both prescriptive and performance oriented and you need a stick when it comes to making sure that there is a proper public warning system with multiple components around each nuclear plant.

And yes, I know the stick always involves wailing but sometimes you need the stick.

At this point I think that we need to take full cognisant of the fact that there have been three major -- quote, quote, "beyond design" parameters, accidents, Three Mile Island in which I participated in a warning system response, General Beale (phon.) where I did not and, of course, Fukushima.

I believe that we need to improve multi-component warning systems around plants.

Mr. Chairman, my understanding is that you asked not too long ago why there are not sirens at Point Lepreau.

Having been in the thick of the action of that project during the mid-1980s I'd be happy during question period to give an answer to that question in any depth that you like.

And finally, I would also like to -- without cost or obligation to Her Majesty in Right of Canada offer any assistance I can give on a volunteer basis to the CNSC in assessing the warning system requirements and needs for Canada.

So I'm not here to do marketing for our company, certainly would provide reasonable amounts of time on a volunteer basis. Last time I checked gifts to Her Majesty were still legal.

And finally I have to say in conclusion, I was extremely disappointed with the review of our initial submission made by staff. They thought we were in the business of selling you products; we're not.

They clearly did not read the submission. In submitting our final submission I have marked all the most relevant areas in red for easy location by CNSC staff.

That concludes my presentation. I'd be

delighted to answer any questions that you may have.

THE CHAIRMAN: Thank you.

And I guess the first intervention I guess that staff may want to reply to.

MR. PERLEY: Fair enough.

THE CHAIRMAN: Some of the things that were made.

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

Mr. President, we welcome a lot of the ideas that the intervenor has presented, especially the volunteer aspect of things. I'm pretty sure the licensees will love it, otherwise it would be more cost recovery.

With all seriousness here, we do welcome this intervention and any ideas we are open to to enhance the safety of the public because our mandate is protection of the public.

Now, with respect to the misreading the intervention and the intervenor, I will pass it on to Mr. Luc Sigouin, who was responsible for the assessment of the disposition of the comments -- or Mr. Raoul Awad, our colleague.

MR. SIGOUIN: Luc Sigouin.

In response to the comment about dispositioning of Mr. Perley's comments, the -- what was published, what was produced was not meant to disrespect his submission.

The submission -- the request for comments was related specifically to the Fukushima task force report. And what Mr. Perley had provided, although very valid information, was not related to any amendments that could be made to the Fukushima task force report and that's why his comment was dispositioned in that way, as were others.

As Mr. Jammal has already mentioned, we welcome the comments that he has made. I think they are valid and can be considered by provincial and federal authorities in going forward on how they might improve the public warning systems.

MR. PERLEY: Mr. Chairman?

THE CHAIRMAN: Go ahead.

MR. PERLEY: The staff stated, quote:

> "The majority of the content of this submission is not in scope of the current review and is a description of the company product." End of quote

First of all, I would like to contest both aspects of that.

First, I believe it is in scope because I believe your action plan in responding to Fukushima should definitely address the issue of evolving national standards for public warning in the off-site situation.

Secondly, our company does not produce or manufacture, sell or distribute warning system products; we are in the technology consulting business so I was, I'm afraid, mystified as to how staff came to those conclusions.

THE CHAIRMAN: Okay, thank you.

Let’s start the questions. Mr. Tolgyesi?

MEMBER TOLGYESI: The intervenor was proposing a kind of composite warning system. What’s the opinion of staff on this system?

MR. SIGOUIN: Luc Sigouin, for the record.

The CNSC works cooperatively with the province -- with the various provinces to -- on the issues of the adequacy of off-site measures, including public alerting.

The decision on -- the final decision on the technology that a jurisdiction would use for public alerting is left to the responsibility of the province, and I think the proposal may be best commented upon by the provincial authorities who are here participating today.

MEMBER TOLGYESI: Do you have a comment? Ontario is here, I think.

MR. MORTON: Thank you very much. For the record, Mike Morton, Emergency Management Ontario.

I'll speak to three aspects of this briefly; first of all, the standard, the responsibilities and the current status within Ontario.

As previously presented to the Commission, and as many Commissioners will be aware, Ontario has specific requirements for public alerting around nuclear facilities. These requirements are outlined in the Cabinet-approved provincial nuclear emergency response plan and specifically in Section 5.7.1 of the first part of that document. And I'll just briefly quote from that document to provide context:

> "The standard within Ontario is that designated municipalities of the five nuclear areas within Ontario shall have plans that provide for public alerting systems as described in the plan. The systems must be of a nature to ensure that the primary zone population [that's 10 kilometres around each of the facilities except for Chalk River, where it is nine] that may be required to undertake the initial protective measures of sheltering, evacuation and/or

ingestion of KI can be alerted within 15 minutes of initiation of the system. The site specific implementing plans will include details of the area and population that may be required to undertake immediate protective measures."

That's the specific standard from the plan. Other parts of the plan outline who has responsibilities for ensuring that such a system would be in place.

At the provincial level, the responsibility under the plan is to identify the standards that the public alerting systems must comply with and the areas that would be covered by those standards. It is then the responsibility of each nuclear facility to fund the implementation and maintenance of that public alerting system.

And certainly the operators in Ontario have been very supportive of this and have provided any of the funding necessary to implement the system.

Finally, and very importantly, it is the designated municipality's responsibility for selecting the system, implementing the system and then maintaining it both from a technical perspective, but also from a perspective of testing and exercises and public awareness.

We believe that this responsibility being at the municipal level is an important part of our approach to emergency management in the province.

Each of our designated areas have specific geography and demographics that distinguish them from each other. For example, as I think we're well aware, the primary zone area, the 10 kilometres around the Pickering nuclear station, has a very different topography and demographic profile compared to, for example, the area around the Chalk River facility and, therefore, the approaches to public alerting taken by those designated municipalities differ substantially from a use of both indoor dialling technology and sirens covering the area around the Pickering plant to an approach that involves a combination of technologies and physical alerting in the Chalk River zone.

We are very actively working and monitoring the status of these public alerting systems and, at the March meeting of the Commission, presented a fairly comprehensive update on compliance with the standards in Ontario.

Thank you.

THE CHAIRMAN: Mr. Tolgyesi?

MEMBER TOLGYESI: Just concerning these levels of responsibilities and jurisdictions, Mr. Perley, did you communicate with these communities to offer what you were proposing here?

MR. PERLEY: Well, we’ve been in communication with various Emergency Measures Organizations across the country and nuclear authorities, both recently and over the years.

I was living full-time in the U.S. from 1996 to about 2002. When I returned to Canada, I conducted a number of briefings for what was then called OCIPEP, now called Public Safety Canada, and was told by two Directors-General and one Assistant Deputy Minister that Public Safety Canada had no interest in establishing national warning system standards, period.

Furthermore, as has been pointed out, and I guess you may want to ask New Brunswick as well because they’re in the room, but all provinces' EMOs are doing their best to try to move forward and to make sure there are standards in place and to have oversight of this because they’re the senior government over municipalities but, again, there is no national standard.

As we’re speaking right now, FEMA is revising its recommended emergency practice 10 -- Rep 10 -- to go beyond sirens and include many other components, and that revision process will result in a new national standard that calls for multi-component public warning systems around every nuclear plant in the country.

FEMA is the subject matter authority which, on behalf of the U.S. Nuclear Regulatory Commission, certifies that a nuclear plant's warning system does or does not comply with FEMA Rep 10. And I would submit to you that the revision of FEMA Rep 10 is a part of the American assessment and response to Fukushima.

And I'm recommending that Canada should do a similar thing and it quickly evolve, obviously, by -- I recommended a forum by consensus among the provinces.

Now, further, to answer the question, I did -- as part of the project I have mentioned, in New Brunswick, conduct a detailed and exhaustive benchmark of Point Lepreau against seven other nuclear power plants and obtained a lot information in that process.

I'm not allowed, you know, without New Brunswick to discuss that in a public forum, but I'm sure that New Brunswick would communicate with you on the details if so requested.

But I think I'm on safe ground in saying that I fully understand the current state of warning system evolution and development for nuclear power plants and other areas that have heightened threat or risk requirements in North America.

THE CHAIRMAN: Okay, look, we've got to stay focused on what’s in front of us today and it’s a plan. And in the plan, in fact, there will be a review, a proposed review of all emergency planning, et cetera, et cetera, and I just want to make sure that we're focussing on our mandate, CNSC mandate.

MR. PERLEY: Well, Mr. Chairman ---

THE CHAIRMAN: Excuse me. Let me finish.

MR. PERLEY: Excuse me, Mr. Chairman, with respect ---

THE CHAIRMAN: Can you let me finish? Can you let me finish?

MR. PERLEY: Sorry.

THE CHAIRMAN: I don’t want to deal with issues that are in the domain of Industry Canada. By the way, that was my previous job. I know all about public alerting, so it is not us who is going to develop a public alerting policy for this country. I want to stick to what we can do.

I will give, though, Public Safety an opportunity to say what’s in the plan if he can share with us, and maybe even Health Canada.

What we want to talk about is what is in our -- in the staff plan for moving forward on Fukushima, so let's just ---

MR. PERLEY: Well, Mr. Chairman, if I may, I did say at the beginning of my presentation, and I'll quote myself, I said, "I believe the action plan needs more work in terms of public safety, in terms of public warning, that you should explicitly call for a national standard to be developed by someone for public warnings around nuclear power plants."

THE CHAIRMAN: Okay, thank you for this input.

Now Public Safety.

MR. TRUDEL: Thank you, Chairman. My name is Pierre Trudel, Public Safety Canada.

I'll give you a little bit of background on the current initiative having to do with national public alerting, the system being developed.

A little bit of history. In February of 2009, the CRTC decided to hear an application made by Pelmorex Communications Incorporated for mandatory distribution of its English and French weather network channels on basic cable. As part of its application, Pelmorex committed to enabling the broadcast of emergency alerts by acting as a national public alerting aggregator and backbone network at no cost to subscribers.

Six months later, the CRTC approved Pelmorex' application and established a one-year limit for launching what we refer as -- what we call the National

Alert Aggregation and Dissemination System, NAADS.

The NAADS is a large part of the national public alerting system, and it is required to enable the issuance and distribution of emergency alerts in Canada.

Recently, in February of this year, the Federal Minister of Public Safety and Environment made an announcement from Pelmorex Communications Incorporated headquarters on the participation of Environment Canada in the national public alerting system and the NAADS.

Environment Canada is the only federal department, at this point in time, currently participating in the -- as an alert issuer. However, 12 provinces and territories have agreed to sign on the agreement.

At this point in time, we are reaching out to what we refer to as the last mile providers, internet, broadcasters basically dealing with the internet, radio and tele to ensure that they can also disseminate alerts.

Although the system is not designed to provide alert around nuclear stations, it has the ability to carry that sort of alert. So I would expect within the next few months, given the number of federal, provincial and territorial partners who have signed on the agreement, that we're going to reach what I refer to as the initial operating capability.

THE CHAIRMAN: Thank you.

Staff, what's your perception about the alerting system we need on site?

MR. JAMMAL: Ramzi Jammal, for the record.

Before I pass it on to Mr. Awad or Mr. Sigouin, I'd just like to –- the intervenor has been calling on the establishment of national standard. As we heard from our colleagues from the CSA -- as a matter of fact, on the record, I'll be asking CSA and inviting the intervenor to work as part of the CSA committee in order to establish and provide his input for enhancement of the alertness.

I'll pass it on to Mr. Awad.

MR. AWAD: Thank you very much. Raoul Awad, for the record.

I think depending where the nuclear power plant is situated, the way to alert people varies, and that clarified by Emergency Management Ontario.

However, we extend our invitation to Mr. Perley to participate with the CSA standard. I think this is one of the forum that we can establish a national standard accepted by all the provinces and the federal community and by consensus.

Thank you.

THE CHAIRMAN: Okay, Mr. Perley, the last word.

MR. PERLEY: Okay. Well, thank you.

I want to just deal with the last mile briefly. In the comments made by the gentleman from Public Safety Canada, he didn’t mention sirens or other devices to warn people outdoors. You need to be able to warn people outdoors and indoors, and the last mile has to include as many components as we can possibly afford to put up and maintain. So I think a comprehensive multi-component approach is required.

I believe that we should look closely at what the Americans are doing. I’m certainly prepared to participate in the CSA’s activities if they extend to public warning systems, but I believe that we have to include all the components in public warning systems, not just the ones that are convenient for Industry Canada.

THE CHAIRMAN: Okay, thank you. Thank you for that. We’re going to move on.

MR. PERLEY: Okay, thank you.

THE CHAIRMAN: Thank you. I think we’ll do one more before lunch.

So the next presentation is from Ontario Power Generation as outlined in CMD 12-M23.5 and M23.5A, and I understand that Mr. Mark Elliott will make the presentation.

The floor is yours.

12-M23.5 / 12-M23.5A

Oral presentation by

Ontario Power Generation

MR. TREMBLAY: Good afternoon, President Binder and Commissioners. My name is Pierre Tremblay. I'm the Chief Nuclear Operating Officer of OPG.

I have with me Mark Elliott, who is our Chief Nuclear Engineer, who will give the presentation, and Fred Dermarkar, who is OPG's Director of Fukushima Project but also the Chairman of the CANDU Industry integration team for Fukushima.

Mark will speak on behalf of the industry, not OPG, and about the very significant efforts made by the industry to respond to the Fukushima nuclear accident.

Other colleagues throughout the day will also discuss other aspects, but I'll turn it over to Mark to begin his remarks.

MR. ELLIOTT: Thank you, Pierre.

Good morning, and thank you for the opportunity to present the perspective of the Canadian nuclear power plant operators on the lessons learned from the events at the Fukushima Daiichi power plant over a year again -- over a year ago.

For the record, I’m Mark Elliott, Chief Nuclear Engineer and Senior Vice-President at Ontario Power Generation.

And in demonstration of the collaboration among the four Canadian nuclear power plant operators, I’m here today speaking on behalf of Hydro Québec, New Brunswick Power, Bruce Power, as well as Ontario Power Generation.

Today I’d like to briefly cover several topics concerning our response to the events at Fukushima, the immediate response undertaken by the Canadian nuclear industry, the review and analysis of information from Fukushima, including a review of potential external hazards based on the location of our plants, our findings and conclusions from the review, which included the increased safety benefits from providing additional equipment for a diverse layer of defence for events where all installed electrical power is lost and also provide a status of key Fukushima follow-up activities for the Canadian nuclear power plants.

We immediately recognized the significance of the event in Japan and quickly mobilized as part of the greater nuclear community to provide support for understanding of events within our Canadian communities. We rapidly moved to understand what had occurred and to consider what lessons we needed to consider in our own plants.

Relatively large numbers of staff have been dedicated to Fukushima follow-up from all groups; operations, engineering, emergency response and so on. The overriding objective of these efforts was to identify improvement opportunities to prevent the occurrence of and mitigate the severity of events similar to Fukushima.

The CANDU owners' group, which has members in seven countries, took the lead in establishing communication across the CANDU community and continues today to provide coordination of activities. Meetings are held regularly to promote alignment and information sharing. And it was OPG President, Tom Mitchell, who headed the WANO executive team reviewing the Fukushima event and its impact. Tom personally visited Japan to help the industry understand what were the strengths and weaknesses and accident prevention, mitigation and response.

The industry has engaged in regular communication with CNSC staff regarding our own efforts and the CNSC staff's multiple written requests and follow-up activities. Each licensee established communication with the public in their area through websites, public meetings and other means to assist our communities in understanding the events unfolding in Japan and what it might mean to us in Canada.

The initial review focused both on current capabilities and external impacts. The reviews confirmed that our plants are safe and that station design and operation are robust and conform to current licence requirements.

The design basis for our plants consider a wide variety of design basis events including equipment failure such as loss of electrical power, internal events such as fires and external events such as earthquakes.

My colleague Bill Pilkington of Candu Energy will be speaking to you shortly on the robustness of the Candu design.

During the reviews looking for vulnerabilities for events beyond our design basis opportunities for improvement were noted and implemented, such as improvements to flood protection.

We re-evaluated or are re-evaluating now the extent to which Canadian nuclear power plants are subject to seismic and tsunami hazards. Canadian plants are located in areas of low seismic activity and have been designed or assessed against seismic hazards.

The locations of Canadian nuclear power plants are such that tsunamis of the magnitude experienced in Japan do not exist. However Canadian nuclear plants have been designed and accessed for flooding hazards and are being assessed for Tornado hazards.

So on the slide now are the principal lessons that we've learned from Fukushima; and there's four of them.

As part of the probabilistic risk assessments which are being updated in compliance with CNSC standard S-294 all nuclear power plants have examined or are examining the potential magnitude and impact of external hazards such as seismic flooding and severe weather, to ensure that safe nuclear power plant operation is not compromised by external events.

All plants provide multiple electrical power and water supplies to ensure essential electrical power and cooling water is always available. These include seismic qualified supplies.

However the events of Fukushima have led us to examine the need for further additional electrical power and cooling water supplies to maintain fuel cooling which can be reliably deployed a loss of all engineered power supplies.

The Canadian plants have always had robust emergency response capabilities in place. However the severity of the Fukushima events have led us to review and revise the technical basis for our emergency plans to include more challenging scenarios beyond our design basis.

And lastly there's also a need to review specific issues such as hydrogen production and mitigation to further protect containment.

Additional provisions to mitigate event progression in a radiated fuel base and other specific issues will be examined as well.

The industry arrived at the following conclusions; emergency mitigating equipment portable and designed to operate following extreme events offers the best additional protection against any event similar to Fukushima, where offsite sources and all onsite installed sources of A/C power are lost.

Improvements to our already robust emergency preparedness and severe accident management protocols are required to address the unique issues that can arise under extreme conditions to deal with any event similar to Fukushima.

Note that the presentation later today by my colleague Duncan Hawthorne of Bruce Power on behalf of the industry will further discuss lessons learned for emergency response.

Implementation of these measures results in additional barriers to ensure that fuel cooling, reactor integrity and containment integrity are maintained. All of this is for the goal of maximizing protection to the public and the environment.

The figure in the next slide shows the impact on fuel cooling graphically, I'll spend a little time on this one.

We can see as the -- if you read from left to right across the screen the first three independent design bases barriers or protections are lines of defence which provide a high level of confidence that adequate fuel cooling will be maintained during an event.

These include in the green the normal operated heat sink powered by normal Class IV powered systems such as the heat transport system and steam generator feed water.

The first yellow is the design basis accident heat sink provided by standby Class III powered systems again using heat transport and steam generator feed water.

The second yellow is the seismic event heat sink powered by seismically qualified emergency power and emergency water systems.

Two additional barriers to protect fuel cooling that have been implemented or accelerated through Fukushima follow-up work are the light orange. That's the emergency mitigating equipment providing additional and portable means to establish a heat sink in the event that the normal engineered measures are unavailable or do not function.

And the dark orange severe accident management guidelines or SAMG which provides direction to assist operators in managing extreme events where fuel cooling functions are challenged.

These guidelines provide the responding crews with multiple pre-considered options to deal with the situations they are facing, to arrest the accident progression, to protect containment integrity and to minimize releases.

When examined in aggregate these five measures provide robust defences and very high confidence that adequate safety will be maintained under even the most challenging of events.

As you can see there's been substantial work in the Fukushima follow-up. The impact of external hazards has been or is being reassessed as part of the probabilistic risk assessment updates.

These assessments provide opportunities for improvement such as flooding protection, and some of these have been identified and implemented already.
And emergency mitigated equipment has been or is being

procured for all Canadian nuclear power plants intended to have additional electrical power and water supplies in place.

Severe accident management guidelines or SAMG have been implemented at Bruce Power, OPG and New Brunswick Power providing proceduralized guidance in place and for which critical staff have been trained.

And I would add that that training and those procedures have been done in such a way to use the latest human performance techniques.

Gentilly will be shut down in preparation for refurbishment at the end of this year and SAMG implementation there is planned as part of refurbishment. The technical basis for emergency response and planning has been or is being revised to better reflect events well beyond design basis.

The installation schedule for additional hydrogen mitigation using passive autocatalytic re-combiners or pars has been accelerated with implementation complete or in progress at all plants. This allows reduction of hydrogen accumulation without the need for power.

The potential for beyond design basis events in the radiated fuel bays has been or is being assessed. Candu has the benefit of lower heat loads in our fuel bays due to on- power fuelling. And emergency mitigating equipment and emergency procedures provide an additional barrier to ensure adequate fuel cooling in the bays as well.

I'd like to show a few pictures of what we've actually done in the last -- since the Fukushima event. You can see on the left hand side an example of the pars -- the re-combiners for hydrogen installed here from Gentilly in Quebec.

And on the right hand side you can see examples of the portable diesel driven pumps and generators, and some of the associated hoses that are shown here from OPG. And in the middle bottom you can see an example of enhanced flood barriers around sensitive equipment supporting emergency generators.

In this slide you see an example of the containment filtered venting system that's installed at Point LePreau in New Brunswick as part of their refurbishment project.

And shown here in this slide are some of the enhanced emergency response vehicles procured at Bruce Power in Ontario to improve backup supplies.

The fire pumper trucks, you can see one in the middle, has been available -- are available to be used as emergency water supplies to station systems, and

additional fire trucks are being added.
So in conclusion the Canadian nuclear power plant operators have quickly and diligently responded to the events at Fukushima.

We've taken immediate actions to improve station defences against extreme events such as those that lead to reactor damage at Fukushima.

We continue to work closely together as an industry to remain aligned with international improvements and to ensure that we share learning's and good practices to further improve nuclear safety in Canada.

And our actions in Canada are consistent with the international approach, including the American flex plan.

So we believe that -- we also believe that the CNSC Fukushima task force action plan is aligned with our own findings and plans. And the specific actions identified in the action plan are aligned with those already undertaken by the licensees.

The Canadian nuclear power plants are safe and they were safe before the Fukushima event. We have learned and we will continue to learn from the Fukushima event. This is a fundamental part of our culture.

We, the Canadian nuclear power plant operators are implementing additional barriers to strengthen defence and depth. We believe that the end result of our activities is improved public and environmental safety against extreme events such as experienced at the Fukushima. We are safer today and we will continue to improve safety going forward.

Thank you for the opportunity to share our actions and response to this truly significant event in Japan one year ago.

THE CHAIRMAN: Thank you. Okay.

Who wants to go first? Questions? Monsieur Harvey.

MEMBER HARVEY: How would you qualify the nature of the work that's been done and will be done? What is the importance of that work? For example, have you an idea of the cost that has been up to now and the cost that we'll have to get to the end when all the measures will be completed?

MR. ELLIOTT: Mark Elliott, for the record. I'll answer it in a couple of ways.

In terms of the importance, one of the ways we show importance is by the urgency, and we responded throughout last year to all of the CNSC requests and our own actions in an urgent manner to put all the things that I've said here in place by now. So there's been a lot of work done on an urgent basis.

As far as the cost, I'll say it's significant. Each utility has a number of projects in place to deal with this and those projects are significant in terms of cost.

MEMBER HARVEY: And the -- what has to -- what has to be done is more important than what has been done? I will ask my question another way.

You had a certain amount of work to do. Where are you in the implementation of all of the measures?

MR. ELLIOTT: I would answer that by saying the most important work is this emergency mitigating equipment, getting that equipment procured and on-site so that we can mitigate an event beyond design basis, and that's where we put our priority.

MEMBER HARVEY: Coming back to your figures with your barriers, you mentioned you had five barriers?

MR. ELLIOTT: That's correct.

MEMBER HARVEY: Okay. And you mentioned that those barriers would be maintained, but in the eventuality of an event, I mean, some of those barriers can be broken right away at the moment of the event?

MR. ELLIOTT: That's correct. And that's why there are five barriers, because the events could cause an issue with certainly the first barrier. If we had lost -- if we lose power, that first barrier, the normal Class 4 power would be lost. So you're right, and that's why we have the number of barriers.

MEMBER HARVEY: That's right. Okay. My understanding was like this.

And what would be the impact for the population if the three first barriers are broken? Very quickly.

MR. ELLIOTT: Because we've added those last two barriers, there wouldn't be an impact on the public. They would be able to mitigate the event before affecting the public.

MEMBER HARVEY: Thank you.

THE CHAIRMAN: Dr. McDill.

MEMBER McDILL: Quick question on the seismic capabilities of the automated radiation monitors; are they seismic qualified?

MR. ELLIOTT: The intent is to be seismically qualified. They're being put in place at all the sites, but I know for OPG they're in place and seismically qualified.

MEMBER McDILL: Do staff want to ---

DR. RZENTKOWSKI: OPG is leading the way in assessing, from the engineering standpoint, feasibility of installing this equipment which will be seismically qualified.

The other licensees are finishing their own assessment and we'll know shortly, but that's the decision of OPG.

MEMBER McDILL: Thank you.

My next question is for staff and I think industry can probably respond as well.

One thing I have not seen and people have asked about is the differences, and we can say the differences as many times as we want between Fukushima and Ontario or Québec or Lepreau, but there's no -- I don't want to call it a simple picture, but maybe you understand what I'm saying -- there isn't a timeline that's, say, on CNSC's website that says this is what happened in Fukushima and this is why, we believe -- there will be people who don't believe that -- but why we believe it won't happen. And it comes up over and over again in paper, but it's never -- it hasn't been shown, to my knowledge, pictorially and in simple language.

So three times today we've heard that an earthquake of 9 on the Richter Scale -- no one said whether it was open or closed Richter -- but 9 on the Richter Scale won't happen and it's 1,000 times worse than 6. But on a timeline for, let's say, a high school audience, that's something that could be shown very easily. And then if you get -- if you'd want to go all the way down the line to the hydrogen explosions that blew the second level of containment off, you could have underneath that why that is not likely to occur. We have hydrogen igniters and, in addition now, passive recombinors.

So you could run that all the way out pictorially to help the public understand better what's going on and you could continue it all the way out to emergency management for the province or the municipality.

How were the people in Japan warned? Well, I think a tidal wave going through your neighbourhood is a pretty good warning but, you know -- I don't mean to be facetious, but sirens go off.

The previous intervenor commented about cell phones being pretty useless. I can tell you that every teenagers sleeps with a cellphone now and it's usually on, and I can hear it vibrating all over the house. So I know that my teenagers are in communication and I fully expect that there's a warning, that someone will come and tell me long before my smoke detector goes off if that's the issue.

So there's a generational issue, but I think -- I think we, as a regulator and the industry as the industry being regulated, could do an awful lot to dispel some of the myths that are out there that the public have no way of confronting or being clarified about.

Is this something that's within our ability to generate? I don't mean that we would make the Japanese regulator or the Japanese situation look worse. I merely mean that we would say why this wouldn't happen here and you could have another tier that says what's coming.

MR. JAMMAL: For the record, Ramzi Jammal.

We will take this comment as an action on us. I very much welcome it.

I agree in principle that we have to make it a reference point that makes sense to the public, because you're very correct and bang on with respect to what is being put out in the public domain from misquotation -- sorry, I'm going to go as far as even discrediting the Commission, discrediting the Commission staff and so and so forth.

So a pictorial progression on what the event and what exists to stop or mitigate the event is in order. So we will take it and then we will work with our communication from that perspective.

I mean, I fully agree; it's just -- we will do it and we'll present the facts as they are into one -- not in one page but in one type of representation. We will take it and we will action ourselves in order to do it.

MEMBER McDILL: And maybe the industry can get involved too with that somewhere.

The one that I think a lot of people are confused about is pool cooling. I mean, it's handled differently in Europe and it's handled differently here, but it's certainly not sitting on the second floor of the CANDU stations, right? So it's something that could really help, I think, for the public.

THE CHAIRMAN: I think this is -- just to add, this is what the Advisory Committee on Recommendation 8 actually meant, tried to explain what's going, not very good at communications.

MR. JAMMAL: And that's why we -- sorry, for the record, it's Ramzi Jammal.

And that's why we say it's an ongoing improvement and that's one of the elements that we have to put in place in order to improve. I'll pass on to Dr. Rzentkowski.

DR. RZENTKOWSKI: Thank you very much for this question. As a matter of fact, in a descriptive way, this information is included in the Task Force Report within Appendix B and we came to this conclusion that it's not very good in terms of communicating to the public.

It’s not good enough; it’s too technical.

We tried to put a graph together, however, there’s too many unknowns because of the differences of the design. You would have to select a certain design as an example; so Candu-6 probably would be the best choice.

And then also the credit for those additional mitigation measures, which are either being implemented or will be implemented, will be extremely crucial to this timeline. So it will be probably better to do it in a year or two from now.

THE CHAIRMAN: I think this is an engineer talking. I think you need -- I think you need some communication experts that can go above the technical kind of a thing and try to explain the differences a little bit simpler.

MEMBER McDILL: I agree that it would be a very difficult graph to present, but I think it’s within the capability of CNSC and industry to do. And you can put a second one out in a year that says, you know, what’s coming or, you know, new. I think it would help a lot.

That doesn’t mean that industry is completely off the hook here, either, you know. We need to keep moving forward.

Thank you, Mr. Chair.

THE CHAIRMAN: Please.

MEMBER VELSHI: So a question for OPG, similar to what Dr. McDill said.

Can you describe in layman's terms what this extreme event would look like and, you know, what it involves in multiple units and so on?

MR. ELLIOTT: Yes.

MEMBER VELSHI: It's what the President calls a doomsday scenario.

MR. ELLIOTT: Yes.

MEMBER VELSHI: I'd like to see what that looks like.

MR. ELLIOTT: Yes. Mark Elliott, for the record.

What we've done as far as the -- is the review that we did last year that -- what the CNSC specified was a bounding scenario or a stress test. That's the event that we're talking about.

It's a loss of all AC power, all power coming from off-site and all on-site power. So that is the event.

So what would happen is you would quickly lose the -- quickly know that you've lost the first -- the first barrier. The event would progress, and you would see that you don't have the second barrier. And the operators would be into their procedures and see that they need to get the emergency mitigating equipment going.

They would dispatch people to -- out to the site of that equipment. They would hook up the equipment, especially to the steam generators, and that would mitigate the event because, as spoken by Dr. Rzentkowski earlier, that if you add water to the steam generators, cool water to the steam generators, you can keep the plant safe for a long, long time.

So that water would come from the lake, in the case of Ontario, and be pumped into the steam generator, so that would arrest it right there.

MEMBER VELSHI: Okay. So it was what the result would be of whatever the event is as opposed to -- you know, it's a seismic event with a fire and so on, okay.

MR. ELLIOTT: No, we purposely went that way where we didn't have -- because what happened in Fukushima was, it was an event that was beyond what they expected. So if we came up with a number of discrete events we could say to ourselves, "Well, what if it's different than we expected?"

So what we -- we didn't go that way. We said, "Whatever the event is that causes loss of power, this is what we'll do."

MEMBER VELSHI: Thank you.

You've seen from the External Advisory Committee and many of the intervenors that the lessons learned seem to focus a lot more on equipment and processes and hardware as opposed to human and organizational factors. And in your presentation on lessons learned I think, other than training where you said you'd look at -- you know, that the focus is very much on human factors.

Can you comment on that? Has that aspect been addressed adequately?

MR. TREMBLAY: It's Pierre Tremblay, for the record.

You know, I think -- and we've been talking to the Commission all along around the physical technical aspects of this, and I would agree that organizational elements are usually longer in terms of coming out. We certainly recognize a number of those factors.

I would say that, you know -- and Mark's comments allude to this a little bit -- the industry could have -- and this is to Dr. McDill's point as well -- could have said, "Look, we're on a stable geological platform. We don't have tsunamis to deal with. We don't have earthquakes" and so it would be easy to conclude that the specific -- the events could not have happened in this country.

We didn’t take that approach at all as an industry. We said, “Okay, maybe that’s not an issue for us, but are there other things, organizationally? What is the degree of unease, if you will, in the industry about possible events?”

And that’s really getting at some of the organizational issues, you know, that surface. And so we took a very -- an attitude that other things could happen that could impact on plant safety.

We have this discussion from time to time about probabilities and we normally get into an argument about hey, listen, get this out of your system. It’s just happened. How would you deal with it?

Well, that’s exactly what we’ve done here. We’ve said, “All right, we take it for granted. It’s happened. How would be manage it? How would we keep this event from becoming a severe accident and impacting on public safety?”

And so I think in the way we are reacting to this, with unease and with urgency, is an indication that we recognize there are organizational factors there.

It would be easy for us to turn our backs on this given the circumstances, clearly major impact on the public. We’re dealing with it in the same manner.

MEMBER VELSHI: Okay. On slide number 8 where you talk about this emergency mitigating equipment, I just wanted to confirm, so is this equipment that's going to be shared amongst the NPPs?

MR. ELLIOTT: This equipment that I'm talking about won't be shared. It'll be on site in each nuclear power plant.

We are working together to develop a regional centre that will have some back-up equipment to that, some spares, some other supplies, but the emergency mitigating equipment described here is on site at each site, and it's for each unit as well.

THE CHAIRMAN: You see here is where, again, simplicity in explanation in layman language would be very useful because now a lot of -- internationally, they're talking about those kind of centres off site.

And we've got to explain that regardless of what happened on site -- it doesn't matter how you got there -- we have enough asset outside to bring in to cool and shut down safely.

Did I get the messaging right?

MR. ELLIOTT: The terms of reference and the equipment that we're buying for that regional centre is just being developed, so that is part of our action plan.

THE CHAIRMAN: But is that what's going to happen eventually? You're going to have a centre where you can get enough assets to bring from off site to on site to shut it down?

MR. ELLIOTT: Off site to on site to back up what's on site; in other words, to be -- to have equipment -- should the equipment on site need to be -- need to be replenished.

THE CHAIRMAN: See, you're getting technical. I just want to hear the word "shut down", what kind of a process you need to bring -- to shut it down.

MR. ELLIOTT: The shutdown will happen without any requirements off site. In any -- in any situations, the reactors will shut down without off-site involvement.

THE CHAIRMAN: Well, then, why do you have an off site?

MR. ELLIOTT: Because in our CANDU reactors and, actually, all reactors, it's not enough to shut down. You have to shut down and keep the fuel cool. And so the on-site equipment will do that and will keep the fuel cool, but we want to make sure that if that equipment needs help, if that equipment should run into trouble, we have back-up equipment, supplies, that sort of thing, to bring to the site that's in trouble.

THE CHAIRMAN: Well, that's what I'm

arguing, that one needs to explain this in very crisp -- because the end objective -- you know, in all your slide, even on your five bars, the end result is -- you know, the last slide. I couldn't resist. This is on slide 7.

MR. ELLIOTT: Yes.

THE CHAIRMAN: The last bar, "Event progression". So no matter what you've done with the five, the event continues. That's the way one can read this, rather than event shutdown, which I thought that's what you want to say.

MR. ELLIOTT: I'll take that feedback.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: On slide number 9, question for CNSC staff.

The Hydro Quebec comment that it's tied to refurbishment, now I'm kind of confused by that. Why would this be tied to refurbishment, and isn't that required for continued operations?

DR. RZENTKOWSKI: It's a simple argument of time at risk because the station would be shut down by the end of this calendar year, and a decision has to be made in order to proceed with the refurbishment.

So even if they try to implement it, there's not enough time.

MEMBER VELHSI: The last question is the

CMD submitted by OPG where you say that the CNSC’s action plan, you agree with it. You say that it should show the relative safety importance of actions.

Is that a comment on the prioritization or the timeline of the actions?

I wasn't sure what you were getting at. It's in Appendix 1, page 13 of the CMD.

MR. ELLIOTT: I'll ask Fred Dermarkar to answer that.

MR. DERMARKAR: Thank you, Mark. For the record, my name is Fred Dermarkar.

What we intended by that comment is that actions that are targeted towards putting physical equipment in the plans, providing procedures in the hands of the operators that will operate that equipment, and providing training to those operators make tangible and real improvements and are at a higher priority than actions that are associated with doing further studies and investigations associated with analysis and so on.

So we wanted to put the focus on making improvements where we know the improvements will be substantive and have those at a higher priority than placing the focus on just doing analysis which actually doesn't result in immediate safety improvements to the plant.

We don't want to say that the analysis isn't important. It is important for giving us insights, but there are things that we know today, without analysis, where we can make improvements. And that's exactly the approach that the industry has followed. We are putting most of our effort in terms of physically improving the plant and helping our operators.

MEMBER VELSHI: Staff, any comment on that?

MR. JAMMAL: For the record, Ramzi Jammal.

To add to this, that's why we establish a facility action item specific to each site, so we start from the high-level requirements. And the execution of those requirements is based on what is currently exist and what needs to be done and that's why we establish -- again, a facility action item that is site-specific and unit-specific at times.

But in answer to your question, we can elaborate a bit more on this.

MEMBER VELSHI: Right. I mean I think it's asking for some kind of categorization that this will have some immediate impact, and this may be a longer term action.

THE CHAIRMAN: Anybody else?

Okay, just a quick couple questions. Your gamma monitors and your power units, do they require power?

MR. ELLIOTT: The gamma monitors are solar powered with battery backup, so they get solar power ---

THE CHAIRMAN: So they're working ---

MR. ELLIOT: And so they will operate without external power.

THE CHAIRMAN: And the PAR units?

MR. ELLIOTT: The power units are -- that's what they're there for. They're diesel generated.

THE CHAIRMAN: No, no, the PAR, the P-A-R.

MR. ELLIOTT: Oh, the PARs? No, the PARs do not require any power at all. They're a passive device that can operate without power.

THE CHAIRMAN: You also mentioned that you've done some studies of tornadoes. Are the studies available? This is on your page 1, you've done some studies on external hazard. For whatever reason, tornadoes seem to capture the imagination of people. They want to know what's the game plan.

So are those reports available?

MR. DERMARKAR: It’s Fred Dermarkar, for the record.

We're doing this in two stages. In our submissions in July we did a preliminary assessment to assess the robustness of the plants against tornadoes, particularly with respect to how effectively we could deploy our emergency mitigation equipment following a tornado. We concluded that we could deploy it.

However, what we also said was we want to do more detailed assessments. Bruce Power and OPG are collaborating on developing a methodology for doing a tornado assessment.

Ontario is more vulnerable to tornadoes, so the focus is more with the Ontario reactors than it is with Gentilly and Point Lepreau.

And that study will be complete this year for the first station, which will be Pickering B.

THE CHAIRMAN: But is there a procedure right now that if you know about a tornado coming near your plant, the plant is supposed to shut down? Is there such a procedure?

MR. DERMARKAR: Even before the Fukushima event, we had in place a severe weather procedure, and depending upon impending severe weather, we take an increasingly defensive posture in the plant leading up to and including plant shutdown if we are anticipating a significant storm or event coming our way.

THE CHAIRMAN: I hear it is often said that all NPP are located in areas of low seismic activity. We have the benefit of an expert here.

I'd like -- again, for the record, Dr. Adams, maybe you can confirm whether this is a true statement or not. Maybe you can give us a range in terms of historical data.

DR. ADAMS: This is John Adams, Natural Resources Canada, for the record.

That's a generally true statement. A lot of the comparisons made with Fukushima don't appreciate that that was an extremely large earthquake. The magnitude scale appears linear to people but in fact it goes up by a factor of 30 for one unit of magnitude in terms of the energy that's released. So a lot more energy went into the ground, it causes a lot more destruction.

When we come to look at earthquakes in eastern Canada, from Point Lepreau through to Ontario, it's a relatively stable part of the earth's crust. We're not on a plate boundary.

That doesn't mean to say that earthquake don't -- will not happen. They certainly do happen, and the historically largest ones are in the magnitude 6 or so range.

When we come to do our seismic hazard modelling for the National Building Code, which is my expertise, we consider earthquakes as large as seven and a half in eastern Canada, but we have to say that those are extremely rare events.

THE CHAIRMAN: But seven, you're getting into some serious magnitude, right?

DR. ADAMS: A magnitude 7 will be a devastating event for any urban area if it was close.

THE CHAIRMAN: Okay, so staff, now again, with all the mitigation and all that, assuming the doomsday scenario, what's going to happen?

Why don't you answer, Jammal, rather than tell him what to say?

(LAUGHTER/RIRES)

MR. JAMMAL: Okay. For the record, it’s Ramzi Jammal.

All I wanted to say is your doomsday scenario, sir, is based on a safe shutdown first. Okay. And the doomsday scenario has been misquoted quite a bit with respect to seismic values. I'm sorry, I'm going to have to diverse and answer that question broadly.

So regardless of the event, Dr. Adams is talking about 7.5. Yes, it will cause damage. It will cause damage for buildings. It will cause damage to structures.

We're talking here about the nuclear power plants where the safety systems have been seismic qualified and robust in order to respond to any event at any magnitude, the reactor would shut down.

As we heard today that there are compensation measures in place onsite and offsite to maintain that safe shutdown in order to cool the reactors.

So yes, the studies -- and I will call onto our specialist, if we need to go into the technical details with respect to what does 7.5 mean; is it under the reactor or at a distance from the reactor.

But regardless what is the magnitude, the reactors will shut down. As a matter of fact, the reactors safely shut down at Fukushima due to the earthquake.

If there was no tsunami in Japan, the maintaining of the reactor in a safe shutdown state would not have been -- we would not be talking today about the Fukushima incident. So the tsunami was the major destruction that did take place.

So again, all our reactors and if they were not safe, we would not be recommending to you to license them from that perspective.

THE CHAIRMAN: Okay. Thank you.

I think this is a good time to break for lunch. We will reconvene at two o'clock? Two o'clock please.

--- Upon recessing at 1:10 p.m./
L'audience est suspendue à 13h10

--- Upon resuming at 1:58 p.m./
L’audience est reprise à 13h58

THE CHAIRMAN: Okay, can we get settled down.

I’m told that Mr. Elliott wants to share with us some remarks.

MR. ELLIOTT: Yes, thank you. Mark Elliott, for the record.

I just want to clarify one thing that I said that wasn’t correct this morning.

I was asked about the near boundary gamma monitors, the automatic gamma monitors at OPG. The gamma monitors are automatic, are solar powered with battery back-up, but the design requirements do not require it to be seismically qualified.

So I apologize for what I said earlier in answer to that question.

What we do though, should they fail, is we have our previous method that we’ve always used, which is survey teams that are still in place and still would go out and get that data, as we’ve always done. That is still in place.

THE CHAIRMAN: Staff?

MEMBER McDILL: So in the event of a -- in the event of an event, ---

MR. ELLIOTT: Yes.

MEMBER McDILL: --- there is still an alternative to those?

MR. ELLIOTT: Yes. We would send the teams out, as we have done before we installed these.

THE CHAIRMAN: Okay, well since there was a question I wanted to ask you and I didn't, so tell me -- just tell me that -- what would be reasonable to expect in terms of a comprehensive exercise emergency exercise to deal with the doomsday scenario -- such a doomsday scenario that involved all the parties, all governments inside the fence and outside the fence? How often should such an exercise be carried out?

MR. ELLIOTT: You know, I'm not trying to duck the question, but it is -- that subject is being covered by our -- my colleague, Duncan Hawthorne, on Emergency Preparedness. He talks about the drills that are coming, what they involve and -- so I think he's certainly prepared to come up after, if you don't get exactly what you're looking for.

THE CHAIRMAN: I know that partial drills are done. I'm talking about the big one, with the federal government, the provincial government, the local municipality and the operators in every site.

MR. ELLIOTT: Yeah, I'd like to defer that to that presentation if I could.

THE CHAIRMAN: Well, there's something that presumably we will -- will be one of the plan -- its action plan that we will hear about eventually on a site-by-site -- is that right?

MR. JAMMAL: Ramzi Jammal, for the record.

That's correct, sir. That's why we presented to you a proposed plan for the large-scale exercise and that's where you're going at.

And yes, as part of the discussions we had this morning of prescriptive requirement is proposed timelines and a proposed plan for large-scale exercises.

THE CHAIRMAN: Because I understand no such exercise has been conducted for ---

MR. JAMMAL: Quite a few years, actually. The last -- approximately either '97 or '98, the last large-scale exercise was conducted.

THE CHAIRMAN: I see Health Canada dying to say something.

MR. AHIER: Thank you. Brian Ahier, for the record.

The last full-scale exercise of the federal nuclear emergency plan, in partnership with provinces and the utility, the U.S., and in fact international partners, took place in 1999.

Since that time, as you've mentioned, there has been a series of other levels of exercises, both at federal level involving provinces and international exercises as well.

But certainly in terms of a full-scale exercise of the entire -- the entire response involving all the jurisdictions, that was in 1999 and our exercise plan calls for preparing for one in the fall of 2013.

THE CHAIRMAN: Okay, I think this is something that should be reviewed in view of the Fukushima experience.

Okay, thank you.

La prochaine présentation sera en français, par les représentants d'Hydro-Québec, tel qu'indiqué au document 12-M23.12. On m'a dit que ce serait M. Désilets, qui va faire la présentation. Alors, Monsieur Désilets, vous avez la parole.

12-M23.12

Oral presentation by

Hydro-Québec

M. DÉSILETS: Merci, Monsieur Binder. Cela nous fait plaisir d'être ici aujourd'hui pour vous faire la présentation au nom d'Hydro-Québec et du reste de l'industrie. Je vais passer la parole à M. Patrice Desbiens, chef des services techniques, qui va faire cette présentation.

M. DESBIENS: Merci, Monsieur le président, Messieurs et Mesdames les commissaires, agents de la CCSN, et collègues de l'industrie, bonjour.

Mon nom est Patrice Desbiens d'Hydro-Québec et je suis le chef des services techniques à Gentilly-2. Au nom de l'industrie nucléaire canadienne, je vous présenterai un résumé des initiatives et des réponses apportées par les titulaires de permis pour faire suite aux événements de Fukushima.

Les événements de Fukushima ont généré une attention immédiate de la part de l'industrie nucléaire canadienne et les différentes tâches d'analyses et de suivis s'effectuent de manière coordonnée depuis ce temps. La mobilisation diligente des opérateurs de centrales aura permis de répondre rapidement à la requête de la CCSN du 17 mars 2011.

Chacune des centrales a assigné une équipe multidisciplinaire aux investigations internes demandées et la démarche d'analyses s'est poursuivie avec des équipes de spécialistes issues de toutes les centrales. Les résultats ont aussi été partagés avec les propriétaires de CANDU à travers le monde et avec nos autres partenaires internationaux.

Ce qui ressort prioritairement peut se résumer ainsi. Pour poursuivre l'amélioration de la sûreté de nos installations, nous allons augmenter la redondance de nos moyens de protection contre les événements externes susceptibles de générer des accidents sévères. Nous allons aussi rendre nos plans d'urgence plus efficaces et développer des mécanismes et des réponses rapides en cas d'urgence.

Ces conclusions recoupent les recommandations contenues dans le rapport du groupe de travail de la CCSN sur Fukushima et dans le plan d'action du personnel de la CCSN qui a suivi.

Les objectifs de renforcement de la défense en profondeur des réacteurs et de l'amélioration de l'intervention d'urgence sont aussi les-nôtres. Les attentes de la CCSN sont intégrées au déploiement des actions retenues. Le travail est commencé et nous entendons respecter les délais de réalisation du plan de mise en œuvre qui nous conduira au plus tard à la fin de 2015.

Le groupe de travail de la CCSN a conclu à l'automne dernier que les centrales nucléaires canadiennes sont sûres et que le risque qu'elles posent pour la santé et la sécurité des Canadiens ou pour l'environnement est très faible. Rappelons que la requête de la CCSN de mars 2011 demandait aux titulaires de permis que l'examen préalable des leçons tirées du séisme survenu au Japon ainsi que le réexamen des dossiers de sûreté soient réalisés avec une attention accrue sur les risques externes, tels que les séismes, les inondations, les incendies et les conditions atmosphériques extrêmes. Il en ressort que la conception du réacteur CANDU et ses procédures d'exploitation sont adéquates pour les événements prévus à la conception, qui possède déjà une portée étendue.

Le retour d'expérience de Fukushima montre cependant que des événements externes extrêmes peuvent tout autant menacer les sites nucléaires que leur zone environnante et mettre ainsi en péril le refroidissement du combustible et l'intégrité du réacteur. Il faut donc renforcer nos lignes de défenses pour augmenter les capacités d'affronter de tels événements. L'utilisation d'équipement portatif constitue la meilleure façon de renforcer ces lignes de défense pour éviter les accidents sévères. Ce sont entre autres des moyens supplémentaires de ré-alimentation électrique et d'appoint d'eau.

Il faut aussi se munir de protocoles robustes d'intervention d'urgence. Bruce Power nous présentera dans quelques instants ce que les titulaires de permis veulent réaliser pour améliorer les interventions d'urgence. Notons que les enjeux principaux portent sur l'efficacité des communications et la définition claire des rôles et des responsabilités des principaux acteurs appelés à intervenir dans de telles situations d'urgence. La formation renouvelée des intervenants de même que des exercices d'intervention sont aussi favorisés.

En plus de la revue des plans des mesures d'urgence et de l'acquisition des équipements de mitigation, d'autres travaux ont été lancés dans la foulée des évaluations réalisées depuis les événements de Fukushima. Ces activités sont toutes incluses au plan d'action du groupe de travail de la CCSN et seront réalisées dans un horizon d'un an, de deux ans ou de quatre ans. De nouvelles études de sûreté sont en cours, de même que l'élaboration de nouvelles procédures sur la gestion des accidents graves.

Le point principal est l'ajout d'une barrière supplémentaire afin d'éviter qu'un événement ne devienne un accident sévère. L'utilisation d'équipement portatif de mitigation, telles des génératrices portatives ou des pompes portatives, permet d'assurer la réalimentation électrique rapidement ou d'appointer de l'eau afin de protéger l'intégrité du combustible en tout temps. Ces équipements doivent être entreposés à proximité des centrales de façon à pouvoir être raccordés les génératrices portatives ou des pompes portatives permettent d’assurer la réalimentation électrique rapidement ou d’appointer de l’eau afin de protéger l’intégrité du combustible en tout temps.

Ces équipements doivent être entreposés à proximité des centrales de façon à pouvoir être raccordés rapidement grâce à des procédures disponibles et à la formation préalable des utilisateurs.

Une deuxième barrière supplémentaire consiste à protéger l’intégrité du bâtiment réacteur, en évitant l’accumulation d’hydrogène, en permettant l’ajout d’eau aux cassons et, si nécessaire, en permettant une relâche filtrée des gaz accumulés dans le bâtiment réacteur.

L’installation de recombineur d’hydrogène a donc été accélérée et l’évaluation des événements associés aux piscines se poursuit.

En conclusion, CANDU Energy nous exposera tout à l’heure les nombreuses caractéristiques de sûreté du réacteur canadien conçut selon le concept de défense en profondeur.

La robustesse et la redondance des systèmes sont des qualités intrinsèques à sa conception et les inventeurs d'eaux multiples visent le refroidissement du combustible en toutes circonstances.

Tel que mentionné précédemment, les deux réacteurs CANDU-6 de Cernavodă en Roumanie ont réussi le test sous contrainte ou le "stress test" imposé l'an dernier à toutes les centrales nucléaires européennes, ce qui confirme le positionnement avantageux de notre réacteur. Les centrales CANDU sont sécuritaires. Nous n'en prenons pas moins au sérieux les leçons apprises par les évènements de Fukushima.

La démarche responsable des opérateurs de centrales canadiennes sera maintenue. Des analyses rigoureuses et intensives ont été menées et nous appliquerons un suivi discipliné du progrès des mises à niveau lorsque requise.

La volonté de l'industrie nucléaire canadienne est de mettre en place des mesures et des moyens supplémentaires pour encore mieux se prémunir contre les risques externes extrêmes susceptibles de générer des accidents sévères, ce qui est cohérent avec la démarche règlementaire proposée par la CCSN.

Notre approche est responsable et conforme à la réalité règlementaire au plan d'action de la CCSN et aux standards internationaux.

Merci.

LE PRÉSIDENT: Merci beaucoup.

Des questions, Monsieur Harvey?

MEMBRE HARVEY: Merci, Monsieur le Président.

Vous nous avez présenté la -- ce qui se fait au sein de l'industrie en général.

J'aimerais savoir ce que ça veut dire plus précisément pour Hydro-Québec. Je prends juste un exemple lorsqu'on était à Bécancour l'an dernier pour le renouvellement du permis, il avait été question des équipements additionnels et il me semble, si ma mémoire est fidèle, que déjà Hydro-Québec avait ou était en voie d'obtenir ces équipements-là, de pompes pour voir s'il y avait des défaillances.

Ça fait que ce n'est qu'un exemple, mais j'aimerais bien savoir là -- et plus vous étiez dans une démarche pour la réfection de la centrale. Donc, il peut y avoir un certain nombre d'éléments de ça qui étaient déjà prévus.

Ça fait que dans tout ce qui est fait, qu'est-ce qui est nouveau pour Hydro-Québec?

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Les choses qui sont faites, les recombineurs d'hydrogène ont été installés, au complet, au total, dans le bâtiment réacteur lors de notre dernier arrêt annuel. C'est une activité qui était prévue à la réfection mais qui a été devancé suite à Fukushima.

Et pour le reste, c'est exactement comme vous avez dit. Les grosses modifications étaient déjà prévues à la réfection. Ça avait été identifié comme étant nécessaire dans le cadre de notre étude probabiliste de sûreté et l'événement de Fukushima confirme que c'est exactement ce qu'il faut faire.

Donc, l'ajout d'un système de décharge filtrée, comme on a vu sur les images plus tôt, est un appoint d'eau aux caissons sont prévus à ce qui va être fait pendant la réfection.

MEMBRE HARVEY: Est-ce que ça veut dire que l'essentiel des dépenses nécessaires à la mise à niveau sont faites.

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Elles ne sont pas encore faites, mais sont planifiées. Le gros morceau c'est les modifications majeures qui sont faites pendant la réfection et elles sont prévues.

MEMBRE HARVEY: Je comprends.

Mais pour vous, il n’y a pas de surprise parce que c’était prévu à la réfection?

M. DESBIENS: Exactement, exactement. Les gros morceaux -- il y aura certainement des ajouts. En fait, c’est sûr qu’il y a des ajouts, mais les morceaux les plus significatifs étaient déjà prévus pour la réfection.

MEMBRE HARVEY: Et j’en viens à ma -- j’ai tout fait ça pour arriver à ma question principale. C’était de -- votre président disait, il y a quelque temps, que Hydro-Québec attendait deux choses avant de décider pour la réfection. C’était l’évaluation finale des coûts à Point Lepreau et l’analyse par AECL des coûts que la catastrophe de Fukushima attendraient.

Donc, où en êtes-vous dans ces évaluations-là? Avez-vous une idée ou vous attendez toujours la -- Point Lepreau, ça achève. Vous devriez avoir une bonne idée où ça s’en va?

M. DÉSILETS: Mario Désilets, pour l’enregistrement.

On a -- comme vous savez, on attend la décision du gouvernement et cette décision-là va venir suite à un rapport qu’Hydro-Québec va soumettre au gouvernement, qui va inclure les éléments suite au rapport de Fukushima, qu’aujourd’hui on est en train de discuter.

Et l'autre élément que le gouvernement veut aussi avoir le résultat final suite à ce que Lepreau sera de retour en ligne, sur le réseau.

MEMBRE HARVEY: Sans vouloir vous mettre dans l'embarras, avez-vous une idée des délais avant que vous soumettiez un tel rapport au gouvernement?

M. DÉSILETS: Mario Désilets, pour l'enregistrement.

Bien, le rapport, il va être émis lorsque Point Lepreau va être de retour sur le réseau.

MEMBRE HARVEY: Merci.

LE PRÉSIDENT: Monsieur Tolgyesi?

MEMBRE TOLGYESI: Merci, Monsieur le Président.

Vous avez parlé d'acquisition des équipements de mitigation, portatives mobiles. Est-ce que ça était fait, c'est acquis, vous les avez?

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Ce n'est pas encore complété. C'est en cours et ça va être fait pour le 31 août. Ce qu'on a fait très rapidement suite à l'événement de Fukushima c'est qu'on a pris contact avec Hydro-Québec, le côté hydraulique de l'entreprise, qui a un dépôt d'équipements d'urgence, des génératrices, des réserves de carburant et puis on a confirmé qu'on avait accès à ces équipements-là, en cas de nécessité. Ça a été le premier geste qui a été fait pour sécuriser la situation et puis on est en train de procéder aux démarches administratives pour faire l'acquisition de ces équipements-là. Ça va être fait d'ici le 31 août.

MEMBRE TOLGYESI: Et ça, ça veut dire aussi que ces équipements sont situés ou entreposés à l'extérieur de façon facilement accessible et pas trop loins?

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Exactement. C'est un compromis qu'il faut trouver pour que les équipements soient suffisamment proches pour être faciles d'accès, mais suffisamment loins pour ne pas être affectés par la même chose qui aurait causé un problème à la centrale.

Habituellement, ça veut dire sur le terrain de la centrale, mais juste un petit peu à l'écart des bâtiments.

MEMBRE TOLGYESI: Dans la présentation d'OPG, il y avait question de guide de gestion des accidents sévères, que c'est quelque chose qui est retardé peut-être à Hydro-Québec pour certaines raisons, notamment en ce qui concerne la décision de réfection.

Pouvez-vous commenter?

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Le protocole ou la façon -- les stratégies pour réagir aux accidents sévères ont été développées il y a quelques années, conjointement par l'industrie. On appelait ça les Guides de gestion des accidents graves génériques. Et là, chaque centrale devait se les approprier, les adapter à son propre contexte puis faire les ajustements en centrale pour pouvoir les mettre en action.

C'est un travail d'envergure qu'on va –- bien, qui a été commis, qui a été engagé pour être complété par la réfection, à être complètement implanté au moment du redémarrage.

Point Lepreau avait pris le même engagement. Étant donné le "timing" de leur réfection, ça vient d'être complété pour eux et puis on suit le même chemin. Alors, ça sera fait quand on va redémarrer.

MEMBRE TOLGYESI: Et vous ne savez pas ça va être quand?

M. DESBIENS: Exact.

LE PRÉSIDENT: Dr. Barriault?

MEMBRE BARRIAULT: Juste une question. Prévoyez-vous que ça va rallonger la réfection au point de vue de temps de faire les changements qui doivent être faits?

M. DESBIENS: Patrice Desbiens, pour l'enregistrement.

Pas du tout. Comme je disais, les gros morceaux qui nécessitent beaucoup de temps, c'est des modifications majeures qui devaient être apportées et qui étaient déjà prévues à la réfection. Donc, c'est sans impact.

Puis le reste, comme les accidents sévères et puis l'implantation de nouvelles procédures, la formation des gens, ça va assez facilement s'inscrire dans l'ensemble de l'exercice de réfection.

MEMBRE BARRIAULT: Merci.

Merci, Monsieur le Président.

MEMBRE TOLGYESI: Dites moi, s'il vous plaît, quand vous regardez, vous attendez le rapport de la réouverture de Point Lepreau. Après, il y a l'évaluation des coûts, et cetera, ça veut dire que quand vous prévoyez, si ça va bien, vous déposez le rapport -- Hydro-Québec, supposons qu'il l'approuve -- ça veut dire que ça va être quand à peu près la réfection qui va commencer et qui va peut-être finir aussi -- qui planifie à finir au moins?

M. DESILETS: Mario Desilets, pour

l’enregistrement.

On prévoit, à peu près une période entre 16 et 18 mois avant de compléter l’ingénierie qui -- parce qu’on a une bonne partie de faite. Mais pour finaliser là, on prévoit entre 16 et 18 mois avant de pouvoir débuter les travaux aux réacteurs.

MEMBRE HARVEY: Donc, ça veut dire que la centrale va être mise en berne pour cette période-là parce que votre permis va périr -- va se terminer, à moins que vous reveniez et puis que vous demandiez une permission spéciale avec des conditions spéciales.

La centrale serait, à toutes fins pratiques, non-opérationnelle pour 16 mois, plus le temps de la réfection.

M. DÉSILETS: Mario Désilets, pour l'enregistrement. Tel que spécifié à notre permis d'exploitation, à la fin de l'année, on va mettre la centrale en état d'arrêt garanti et, en attendant le projet, la centrale a des travaux à faire et puis c'est ça qu'on va… c'est là-dedans qu'on va s'engager.

Et, l'avantage de ça, c'est que -- au début, on avait prévu faire nos travaux en parallèle avec ceux de réfection, ça fait qu'on va éliminer la partie de nos travaux pour permettre de se concentrer après ça juste sur la réfection.

M. HARVEY: C'est très clair. Merci.

THE CHAIRMAN: Merci. Autre question. Pour être très très précis, j'aimerais poser une question précise. Est-ce que le plan d'action de CCSN va imposer des coûts additionnels importants?

M. DÉSILETS: Mario Désilets pour l'enregistrement. Comme Patrice l'a dit tantôt, le plan d'action que la CCSN a déposé, je dirais la très grande majorité des exigences étaient déjà prévues dans le projet. Ça n'amènera pas…

THE CHAIRMAN: Dans le même projet qui existe déjà?

M. DÉSILETS: Oui. Exactement.

THE CHAIRMAN: Ok. Merci. Alors j'ai une question pour le représentant du ministère de la Sécurité publique de Québec. Alors, que pensez-vous sur le plan d'action qui était proposé? Est-ce que ça marche?

M. RACINE: Pierre Racine, ministère de la Sécurité publique. En ce qui a trait aux mesures qui sont préconisées à l'intérieur même de la centrale, nous, on n'a pas vraiment d'opinion là-dessus. Par contre, en ce qui a trait aux différentes mesures qui sont proposées au niveau des plans de mesures d'urgence externes, on n'a pas nécessairement de problème avec ce qui a été mis de l'avant, notamment l'idée de mieux regarder ce qu'il faudrait faire dans la phase de rétablissement. C'était un chantier qu'on avait l'intention de développer.

Pour ce qui est des exercices plus importants, on n'est pas fermés à l'idée, mais c'est sûr qu'on attend de voir s'il va y avoir… si le projet de réfection va vraiment avoir lieu avant d'en planifier un officiel. Va falloir aussi regarder les impacts budgétaires que ça peut avoir pour nous aussi; ça n'a pas encore été chiffré en tant que tel.

THE CHAIRMAN: Alors le plan existe? L'interaction entre la centrale et les ministères, ça existe? Tout le monde connaît chaque rôle? C'est très très précis, n'est-ce pas?

M. RACINE: Oui. Effectivement, il existe un plan de mesures d'urgence qui est prévu au cas où il arriverait quelque chose à la centrale nucléaire. On appelle ça le PMUNE-G2; c'est le Plan de mesures d'urgence nucléaire externe à la centrale Gentilly-2. Ce plan-là est harmonisé avec les représentants d'Hydro-Québec qui nous aident dedans.

Il y a également les trois municipalités les plus proches de la centrale nucléaire: Bécancour, Trois-Rivières et Champlain qui sont impliquées dans notre planification des mesures d'urgence puis qui ont leur propre planification d'urgence nucléaire si jamais il arrivait quelque chose. Tout ça a été harmonisé de façon à pouvoir faire face à une éventuelle situation d'urgence à Gentilly-2.

On a également des liens avec Santé Canada pour pouvoir se rattacher au PFUM au besoin.

THE CHAIRMAN: OK. Merci.

M. RACINE: Bienvenue.

THE CHAIRMAN: Autre question? Merci beaucoup.

The next presentation is by Professor Michel Duguay, is outlined in CMD-12 and 23.7 and 23.7A. Professor Duguay, the floor is yours. En anglais ou en français?

12-M23.7 / 12-M23.7A

Oral presentation by

Michel A. Duguay

M. DUGUAY: Good afternoon. Thank you for the time to make a presentation. Right away I will jump to the conclusion maybe to spark your interest. Many ecologist groups are asking for a restructuring of the CNSC. So, the document that I submitted is entitled "The Gap Between Nuclear Safety Level and the Expectations Based on the Nuclear Safety and Control Act of 1997".

I watch with great interest the May Day series on television and one learns a lot about complex systems, the interaction between computer-based systems, hardware and the human component. One argument has been used by the nuclear lobby for many times that CANDU reactors have been operating for 30 years without any problems and any big accidents and therefore they're gonna perform as well for the next 30 years. While you could have said that about the Concord on the morning of July 25th 2000. The plane had been flying safely allegedly for 24 years. That day, it crashed, and a few years later was retired from service.

An accident which is more relevant to the present situation is the flight Airbus Air France 447 that crashed on the 1st of June 2009. The pitot probes that were measuring the air speed of the plane were giving contradicting values to the computer system. So, the computer system handed over the piloting to the pilots and three and a half minutes later, the plane hit the ocean. That plane Airbus 330 fell like a stone out of the sky.

I find many parallels between the nuclear business and the industry, the Airline industry. In 1992, the Canada Department of Justice retained the services of Western Geophysical Corporation. And a civil suit had been initiated by Energy Probe, Greenpeace and other groups in

Canada. Western wrote a very good report on what they had done and at the end concluded that canadian nuclear reactors are pretty safe because they're about as safe mathematically, they reckoned, as the airplane, as the airline industry. I question their exact reasoning because you find that the two guys who wrote that report had a vast experience in the United-States and they said: "Well, seismic events have occurred in the States and the reactors survived and inasmuch as canadian reactors are like american reactors, we expect the canadian reactors to do okay." That was the weak point of their presentation.

Now, I have written many pages on CANDU technology and I appreciate very much that Mr. Binder has put some of my writings on the CNSC website, which perhaps gives me some credibility. And I base my whole plea on the ***Nuclear Safety and Control Act of 1997***. That Act, in the first paragraph, talks about preventing unreasonable risks. So, there has to be some kind of evaluation of what we consider "risks" and Western took the initiative of comparing the nuclear risks to the airliner risks. And I do the same here.

But the second paragraph of this law urges the CNSC to disseminate scientific, objective scientific information to the public and we have written many formal letters to the CNSC, and you know very well that you haven't respected 100% that Act; in fact, in your last writings of March 2012, you've written that paragraph B doesn't say that you have to disseminate all information to the public.

So, you're quite right from a legal point of view and I'm not about to challenge you in Federal Court.

So, I'll run rapidly here through the request that we had put in your request for comments and, well this is the business about the oil. I probably will not have time to make all the points that I want but I just want to point out that I have a reply dated as of yesterday to Mr. Jammal's criticism of my writings recently, I have a 10-page reply which I have sent to many people in the CNSC, and I have several copies here for those who are interested. There are important points in there.

Gordon Edwards at the hearing in St. John for Point Lepreau picked up the world statistics on nuclear accidents that Mr. Rzentkowski had brought up and he said well, 15,000 reactor years, five outstanding examples of core meltdowns, there’s been about 10 more when you include research reactors, but that gives a probability of something like once in 3,000 years.

So if you look at one reactor it will be 30 years divided by 3,000, it looks pretty small, but in the case of Toronto you have 10 reactors around the town so the probability of a meltdown in Toronto based on these world statistics is 10 percent, one chance in 10 that over the next 10 years one of the reactors around Toronto will have a core fusion.

So I appreciate the fact that all of you are concerned about mitigation. I appreciate that very much. It might be needed.

A red flag in the whole Canadian nuclear business is that in Gentilly there was the construction of the -- and the operation of the Gentilly 1 reactor in the period of 1971 to 1977. I have been accused of fear mongering in Quebec, even by leaders of the CNSC.

Well, I'll have you notice that in Quebec the nuclear experts became afraid of Gentilly 1 and they themselves shutdown that reactor in 1977 never to be operated again.

When we talked about disseminating information on stuff, I've been asking the CNSC for two years if there had been a report on Gentilly 1 and could I have a copy of it, never got the answer. Perhaps someone in the room here will know if there was a final report on Gentilly 1.

But basically it was done in by the

positive coefficient of nuclear reactivity, which is still operational in all CANDU reactors in Canada.

So the Canadian Nuclear Association I recognize their openness. They wrote what you see on the screen about Gentilly 1.

Now, you all know that nuclear reactors are the targets of many terrorists and probably malevolent persons around the world. You have your reasons to be quiet about that. But we published an article in September in "Le Nouvelliste" in Three Rivers, and the point we made there was to contradict Mr. Jammal. Mr. Jammal has contradicted me many times so I take a bit of pleasure in doing it now.

Mr. Jammal insists very often on the first two seconds -- yes, in the first two seconds you shut down the reactors, push down the rods and the fission is stopped. Yeah, that happened in Fukushima and that can happen many times, but after the first two seconds we know what happened in Fukushima, you have all that reactive radioactive thermal heat, 100 megawatts at first, that has to be evacuated otherwise you run into fusion.

Now, I want to talk about PGA numbers. Again you had an example this morning of what happened in Point Lepreau on December 2nd. Mr. Binder asked the question to his staff if there was an earthquake of magnitude 6.2 can you tell me what would happen, and Mr. Rzentkowski answered, I think quite correctly, definitely the core will melt.

I have written many pages where I justify Mr. Binder’s question, which is precisely what the French in France would have asked, and also I justify the answer that Mr. Rzentkowski gave.

The fact is that in the Point Lepreau area you can have a 6.2 even 6.5G peak ground acceleration earthquake, as John Adams has testified. One thing that needs to be brought up right in this room here, despite all these experts around, it’s not the magnitude that’s a danger to Toronto it’s the PGA, the peak ground acceleration.

You could have a huge earthquake in any one of the three or four centres in a far away belt and once in 20,000 years the PGA in Toronto can reach 0.3G, which is a threshold value for damage to the core. Once in 20,000 years.

You know, for Point Lepreau, in your decision document you told them, well, once in 10,000 years it looks okay and there is not requirement for once in 100,000. But if I put myself in the Toronto position with 10 reactors around here, I would much prefer that you implement obligate them to be safe against once in 100,000 years because you have 10 reactors instead of one at Point Lepreau.

Anyway, these are numbers and those who are interested in studying these numbers, I have copies of my paper here.

When you go through the numbers, you find that the probability of a nasty accident in the Toronto area is 100 times the probability of you having an airline crash if you fly three times a year for 30 years. So it’s 100 times away from social acceptability, I would say.

What’s the significance of a 0.3 percent probability? Well Gordon Edwards, who is a well-known critic, a nuclear critic, thought of the idea that -- the simple idea that .3 percent if you rolled three dice the probability of getting three dice at the casino game is 0.45 percent, so a 0.3 percent probability of a big nuclear accident is not that small a thing.

Anyway, when the probability of an accident gets into that percent level, with three million people in Toronto you have to ask if there’s not a question here of engineering ethics. Our engineers have to take courses on ethics and they must divulge to the public the present submitted danger.

And I urge the CNSC to do a better job at disseminating objective scientific information on the dangers presented by Canadian nuclear reactors.

There's one more slide about the CANDU reactor that you know very well. There was a statement this morning that pipes are checked carefully. Well, there are six kilometres of high pressure tubing. It's not easy to check those tubes. It's almost impossible. I find it very hard to believe that you're keeping track of all these microscopic tracks that cause the Toronto airlines fatal flight in 2002. I'm kind of sceptical about that.

So that's the end of my presentation. Thank you for your attention.

THE CHAIRMAN: Thank you.

Let's open up for questions.

Monsieur Tolgyesi?

MEMBER TOLGYESI:

Monsieur Duguay, y en a, dans votre soumission y en a une petite erreur. Quand vous parlez des probabilités, en anglais c'est bien page 5, parce que vous avez parlé en divisant 15 000 par 5 ---

MR. DUGUAY: Excuse me. I would much prefer that you address your questions in English because most people here speak English and it's serious enough that we can let promotion of French take place on the last page of my document.

THE CHAIRMAN: Excuse me. We have a webcast. It goes national. So the questions are being posed by whatever is comfortable with please.

MR. DUGUAY: Okay, fine.

MEMBER TOLGYESI:

En plus, il y a la traduction simultanée. Donc, à la page 5 de votre présentation, il y a une petite erreur parce que quand vous faites vos calculs, vous dites qu'en divisant 15 000 par 5, que la probabilité de fusion est de .033; c'est diviser 5 par 15 000, c'est ça ce que vous voulez dire, c'est ça ce que vous faites en anglais aussi.

MR. DUGUAY: Well, there may be a little mistake there but the recurrence -- the recurrence period would be 3,000 years for one reactor.

MEMBER TOLGYESI:

Je parle pas de principe maintenant, je veux dire simplement qu'il y en avait une erreur --

MR. DUGUAY: Okay, that's possible. I can correct it.

MEMBER TOLGYESI: Okay.

MR. DUGUAY: Thank you.

MEMBER TOLGYESI:

Alors, ce que – dans l'annexe 1 de cette présentation, c'est – la question est pour le staff. M.

Duguay, il annonce dans sa dernière – dans le dernier paragraphe que informer le public, Hydro-Québec et la Commission canadienne devrait informer le public que la probabilité de réaction nucléaire grave suite aux leçons de Fukushima est maintenant estimée d’être au niveau dix fois plus élevé qu’auparavant.

Est-ce que quelqu’un de staff peut commenter?

M. FRAPPIER: Gerry Frappier pour l’enregistrement.

Nous ne sommes pas d’accord avec les interprétations et les calculs que Professeur Duguay fait. Je pense qu’il faut mettre sur l’enregistrement qu’il s’agit d’une mauvaise application de l’inférence statistique.

L’intervenant utilise des statistiques fréquentes qui sont applicables seulement si on a des événements qui sont répétables et homogènes comme l’idée qu’il parle ou bien peut-être une pièce de monnaie.

Mais ceci ne s’applique pas à des cas d’accidents graves pour les centrales nucléaires. Premièrement, il y a trop peu d’événements et, deuxièmement, les réacteurs à travers le monde sont conçus et exploités complètement différemment.

Alors on n’a pas des exemples ici qui sont homogènes et répétables.

Pour illustrer, si je peux, le problème, parce que je sais que tout le monde veut parler des statistiques et Monsieur Duguay en parle beaucoup, mais c'est pas la vérité. C'est pas des calculs qui font du sens.

Si on a un dé -- on a emmené des dés -- mais j'avais un dé et puis je le roule deux fois et j'ai deux 6, qu'est-ce que ça veut dire à propos de la probabilité d'obtenir un 6 la prochaine fois?

Si on utilise la mathématique que Monsieur Duguay, lui, parle, dans ce cas-là on dirait que c'est 100 pour-cent. On a deux dés. On l'a lancé deux fois. On a eu deux 6, alors deux sur deux ça va être 100 pour-cent.

Mais c'est pas nécessairement le cas. Si on a un dé normal, c'est clair que c'est pas ça. Si on a un dé qui a six côtés et les six côtés ont le numéro 6 dessus, ça serait le cas. Si on a un dé qui a 10 faces au lieu de six faces, qu'est-ce que ça veut dire?

Alors toutes ces probabilités-là vont changer dépendamment de l'univers, si tu veux, de possibilités desquelles on parle.

Alors les statistiques qu'il utilise ne fonctionnent pas pour le cas qu'on parle ici. Alors c'est pourquoi nous avons besoin d'une approche beaucoup plus sophistiquée pour déterminer le risque pour les réacteurs qu'on a, le risque d'accident, et c'est pour cette raison qu'on utilise l'évaluation probabilistique, "probabilistic safety assessment". Les Américains disent "probabilistic risk assessment", en français, l'évaluation probabilistique de la sûreté.

Alors les questions -- la présentation qu'il fait avec les statistiques, tant qu'à moi, comme professionnel -- et puis je suis ingénieur, comme il parle, je n'ai pas de problème avec mes éthiques ici. Ça fonctionne pas pour cette situation de laquelle on parle.

MEMBRE TOLGYESI: Ma dernière question c'est concernant -- it's the consideration of P ground acceleration. I think the gentleman from -- Dr. Adams, could you comment on -- one of the intervenors' statements is that the probability -- did you read that? If you go to the page 5, it's the second paragraph, first sentence, first two lines.

DR. ADAMS: Right. So I'm on page 5 here. I'm reading in English:

> "For Gentilly, the probability of a destructive PGA of .6 G is .5 per cent in 50 years."

So I take that to be -- that's the one in 10,000 years shaking level. The magnitude of that has actually been determined from old equations, including the Weston Report, and it comes back to the validity of the predictions. If you have a certain earthquake at a certain distance, how strong will the shaking be?

And over the last couple of decades, there’s been a big improvement in those ground motion prediction equations. And what has happened is that the strength of shaking at a given distance from an earthquake has been dropping. And so the newer predictions of the shaking level, the hazard, have actually been dropping with time, and that’s basically the position that was put forward by Hydro-Québec in its Gentilly Report.

The probability of strong shaking is now lower than it was or, alternatively, the probability of exceeding a threshold, a particular threshold, is much lower than it was before.

MR. JAMMAL: Merci, Monsieur le Président.

I would like to give a conclusion for Dr. Adams’ presentation; in other words, that the methods utilized for Gentilly-2 are much more conservative than the actual data information that we currently have that’s being used under the National Building Code.

Je vais le répéter encore une fois en français que la conception de G-2 est d’une façon tout à fait conservateur que le standard et les normes actuelles, surtout qui sont basés sur des faits scientifiques et, comme Dr. Adams a déjà mentionné, c'est basé sur des points et des valeurs et puis des équations qui ont déterminé que la conception de G-2 dépasse les normes actuelles.

THE CHAIRMAN: Again, can I jump right into this? You know, we can get into a long debate about probabilities and shaking ground. That's not really what this Commission's concern is.

The Commission's responsibility is not to save the asset. The Commission's responsibility is to make sure that people and the environment are not harmed.

So I don't care what the shaking is and I don't care where it is, and I don't care what magnitude it is. What we care about; will it shut down safely?

And all we've read this morning, I thought, that all the mitigation is being designed to do that. So am I right about the focus of this Commission?

Staff, please, and Mr. Duguay, you can reply to that one too.

MR. JAMMAL: For the record, it's Ramzi Jammal.

It's to confirm the fact that I wanted to conclude with the fact that the safety systems, the assessments for the building and the shutdown systems will shut down the reactor safely.

And as we heard from the presentation by Hydro-Québec, that they have already acquired assets off-site and they have the current capacity in order to maintain the safe shutdown. Regardless of the magnitude, the reactor will shut down safely.

MR. CHAIRMAN: Mr. Duguay?

DR. DUGUAY: While I back up your position, Dr. Binder, 100 per cent. In reply to Mr. Jammal, I would say that the CNSC should introduce a nuance in its language about reactor shutdown.

When you say that the reactor is shut down, you just mean that you're dropping the rods within two seconds and you stop fission, but you cannot stop the decay heat from the radioactive spent fuel, which initially is 100 megawatts. That's what killed Fukushima was that radioactive thermal heat, thermal load.

So to prevent, again, the Fukushima, you will have to do a whole lot of things, and I agree 100 per cent with Dr. Binder that this is perhaps the new challenge, what you can do, assuming you've got the Fukushima syndrome starting, what can you do to stop it? I think you're 100 per cent right.

THE CHAIRMAN: Dr. McDill?

MEMBER McDILL: Thank you.

I'd like to follow up with a quote that came from New Brunswick and it's brought up again here on page 8 of Mr. Duguay's presentation, and it follows nicely with the comments just made a minute ago by both parties.

DR. DUGUAY: Could you speak a little more into the microphone?

MEMBER McDILL: Certainly. Thank you for letting me know. I end up facing this way, which is rude. I'll try to do both.

If we follow up with Dr. Rzentkowski's response, definitely the core will melt. So we assume the reactor has shut down and now what happens?

So can we go through the steps that would be followed to address Mr. Duguay's -- Dr. Duguay's concerns? The rods drop, then what? Keep on going.

DR. RZENTKOWSKI: I wouldn't mind to do it, but before I explain the sequence of events, I also want to clarify on the statement I made in December in New Brunswick. I was quoted personally as saying definitely the core will melt.

However, please look in the proceeding. My words were taken completely out of context, to mislead the public, even here today, and manipulate public perception with respect to nuclear power.

CNSC, in the meantime, made it very clear that this statement was related to a massive earthquake of a magnitude comparable to that in Fukushima, and even larger, not to 6.2 earthquake.

To that question I provided a response before, saying that the reactor will behave as in accordance with the design basis, no consequences.

MEMBER McDILL: I am -- I don't really -- let me try it a different way.

DR. RZENTKOWSKI: Yes, I will take you through the sequence of ---

MEMBER McDILL: Can we refer to a really big event, RBE?

DR. RZENTKOWSKI: Yes. This is actually ---

(LAUGHTER/RIRES)

DR. RZENTKOWSKI: Okay. Sorry about that. So we have a big event, and this was precisely the objective of our assessment, the assessment performed by the Fukushima Task Force.

We have all that protection equipment. We have all the mitigation measures in place, but, nevertheless, no matter how low the probability of the accident is, it may happen tomorrow. And we don't argue this point. And that precisely was the assumption.

So we focused on the complete loss of

electrical power to the site and station blackout. We also considered that in consequence, there would be a loss of all the heat sinks.

As the result-- after sinks, we re-established the sequence of events, what would happen if this was the case.

First, the natural circulation will establish itself. As I explained this morning in my presentation, as long as there's water present in the steam generators, the natural circulation will continue to cool the fuel.

And even if we cannot provide the water to heat exchangers, then -- or steam generators -- the natural circulation probably will continue for approximately seven hours. But if you can provide water to steam generators, it can continue for days. So this will provide enough time for any kind of external intervention, to mitigate the consequences of an accident.

What will happen after seven hours if we cannot provide the water anymore to the heat exchangers? Then another option is to provide the water to the Calandria shield tank. This is now being put as a part of the upcoming work under the Fukushima Action Plan. This feature has been already implemented at Point LePreau, so it can be fully credited.

So if you provide cooling to the shield tank, then molten fuel -- because eventually the primary heat transport system will overheat, because of rising pressure will be discharged to the Calandria vessel through the end shield -- shield.

And then it will be cooled in the moderator. So molten fuel is not going to propagate outside of the Calandria vessel. The accident will be arrested right there.

However, there would be overheating of the moderator in the Calandria vessel, and the moderator, or the vapour, will have to be vented to the containment. As a result the containment will be over-pressurized, and that's why we have these emergency passive filters, so that this pressure can be released from the containment, and containment envelope can be protected.

The main objective of the severe accident management guidelines is to protect the containment envelope so that there is no releases to the environment.

And very much so, I provided the answer in December along those lines, but of course this hasn't been repeated here today by Professor Duguay.

MEMBER McDILL: Is there ---

MR. JAMMAL: If I may, Dr. McDill, may I add something to the sequence of events here?

And, for the record, I would like to quote the -- I have before me here in my hands the report of the European Nuclear Safety Regulations Group which is the European Council, and they went through quite an extensive assessment by international experts.

And as Dr. Rzentkowski described the events, I would like to share with the Commission and the public the scientific facts from the international community on a similar design to Point LePreau, or actually, where they went to the cliff-edge effect or what our President calls "doomsday scenario", where the capacity of maintaining the cooling without any intervention from the steam generators for at least four days. They even took the scenarios -- in fact, if there is one of the water treatment is in maintenance, they have three days of emergency.

They go on with respect to the loss of ultimate heat sink, the loss of heat sink, the capacity, the scenario, and the conclusion that there is adequate and sufficient cooling in order to "no intervention." And this is where nothing is done, and how much time that there is in place.

So the peer review conclusions for such, that the dousing tank inventory, the capacity of steam generators, the EPS steam generators, so on and so forth, have more than adequate coverage with respect to the maintaining the safe shutdown of the reactor.

MEMBER McDILL: Is there a flow chart of this available for the public to look at, to see these steps coming on bit by bit?

DR. RZENTKOWSKI: To demonstrate the sequence of events?

MEMBER McDILL: M'hm.

DR. RZENTKOWSKI: Yes, We can produce this flow chart, based on the information provided in our task force report.

MEMBER McDILL: Thank you.

Monsieur Duguay, question?

MR. DUGUAY: What is your question?

MEMBER McDILL: I'm asking if you have any further questions, comments? Yes, thank you.

MR. DUGUAY: Well, if you're very observing, you could have seen right in this room what I was complaining about. I'm not complaining about just the CNSC; I'm complaining about OPG and Hydro-Quebec, and the OPG speaker was also speaking for Hydro-Quebec.

Mr. Mark Elliott said that all Canadian nuclear power plants are in regions of low seismicity, but the Fukushima Group wrote a report in October last year saying that Gentilly is in a region of moderate seismicity and Point Lepreau in a region of low to moderate seismicity.

Gentilly is not in a region of low seismicity. You can have within 10,000 years a PGA, P ground acceleration as high a 0.6g, and that figure was confirmed to me by John Adams, who did the special calculations for it.

So, you know, you had the -- a man in charge of Hydro-Quebec many years ago, Allan Copsis, for whom I have great admiration. Let me point out to you that I have a PhD. in Nuclear Physics. I was for a good 10-20 years in the States, a sympathizer of nuclear energy. I used to follow the news of the nuclear industry on a weekly basis.

And Alan Copsis said something very simple, in an interview with Elaine Dewer. He said, "You know, in this business you need precision. You know, these Pitot probes on Air France Flight 447, these Pitot probes? They were giving wrong information and the plane crashed." I think André Harvey said it in one of these public hearings, "You've got to be careful about -- you have to be careful about the small things. Just small things that go wrong can put you in a lot of trouble."

So it makes me even more nervous when I hear OPG make imprecise statements, and the man from

Hydro-Quebec, Patrice Desbiens, basically not giving out any factual, scientific information to date on the refurbishment project. And you can quote me many times about that.

THE CHAIRMAN: Okay. Anybody else?

MR. DUGUAY: Thank you.

THE CHAIRMAN: Monsieur Harvey?

MEMBER HARVEY: Oui, juste une question.

C'est qu'on a discuté de point très précis qui sont intéressants et, je pense, très importants, mais je poserais juste une question à Monsieur Duguay, parce qu'on est ici pour discuter aussi du plan présenté par la Commission canadienne de sûreté nucléaire, du plan présenté.

Qu'est-ce que vous pensez du plan qui a été présenté pour agir suite à Fukushima?

MR. DUGUAY: Well, overall, I'm well impressed by this very extensive talk about mitigation and all kinds of stuff. It looks excellent. It's -- I'm quite impressed. I've already told a reporter about that during the lunchtime, and -- but, you know, you said the right thing once on one of these public hearings: "You've got to pay attention to details." In fact, we teach that in engineering, "You have to pay attention to details." I'm sure that Dr. Moyra McDill has said that many times to her class. The nuclear business is -- you know, Greenpeace quoted Richard Feynman as saying that nature cannot be fooled -- Richard Feynman, who was on the commission to study the Challenger catastrophe in the States, he said, "Nature cannot be fooled".

MEMBER HARVEY: Mais croyez-vous que la demarche propose par la commission, justement, va tenir compte de ces petit détails?

MR. DUGUAY: Well, yes. Everything I've seen this morning looks very good, and going into this tremendous push towards mitigation I'm quite impressed by that.

THE CHAIRMAN: Well, I think -- nice to hear some positive remarks here. But I do need to give you some precision on detail.

I was actually disappointed in your observation that we hid behind the idea that we do not release all the information. In fact, we've been trying to release all the information that we can.

The only thing that we hold back in Commission is security information, so that was the meaning of the "all", and you can imagine the security information, our security people will not allow for some facility security systems to be disclosed. And these are the only things. Otherwise, we are trying to put on the record in the public and post it as much as we can any information that we have.

So just so you know what we're holding back, it's purely the security issues.

And on the G1 report, if such a report exists, I'll try to find it. Anybody -- I hear somebody raise their hand. Maybe we'll find it.

Mr RINFRET: Bonjour. François Rinfret, responsable du programme de règlementation pour G-2. À ma connaissance – et puis on a recherché cette information au cours des derniers mois avec du personnel ici – s'il existe quelque chose, ça a été archivé.

Par contre, ce qu'on a vu, ce sont des discussions lors de réunions de la Commission sur différents aspects des problèmes qui sont survenus à la centrale de G-1 pendant les quelques mois d'exploitation de ce réacteur.

Ce qui m'amène à vous mentionner que il serait faux de comparer trop facilement le réacteur de G-1 à celui de G-2. Le réacteur de G-1, c'est un réacteur à roues légères, c'est un réacteur qui est très instable, et puis ça a été assez rapide, merci, de voir l'EACL comprendre qu'ils avaient peut-être pas une conception qui était très agréable, très conviviale, qui présentait, oui, certains risques d'exploitation dans son instabilité en puissance.

Donc, pas de rapport pour G-1 à notre connaissance, mais des discussions qui montrent que il y a des difficultés d'exploitation et des exigences de la Commission du temps, de l'ACCA.

THE CHAIRMAN: Est-ce que ces documents sont disponibles?

Mr RINFRET: Certains éléments, oui. On en a des copies disponibles. On a pu en retracer.

Sauf qu'en bout de ligne, ce n'est pas la commission qui a forcé le titulaire à fermer la centrale. C'est la centrale qui a décidé, c'est-à-dire l'opérateur qui a décidé de couper les opérations. Alors, nous avons une certaine culture de sûreté. Merci.

Mr JAMMAL: Monsieur le Président, si vous permettez une chose à préciser là ici -- c'est Ramzi Jammal pour l'enregistrement – la conception des deux réacteurs sont tout à fait différentes. Alors je voudrais préciser ça. Il y a un rapport, mais je ne veux pas que – c'est pas je veux pas – alors si on a l'information, on va la donner à M. Duguay, mais c'est le point à préciser, c'est la conception entre G-1 et G-2, c'est pas pareil, c'est deux conceptions tout à fait différentes

THE CHAIRMAN: Last word.

MR. DUGUAY: Well, just to reply to Mr.

Jammal.

Yes, G1 was made with vertically oriented tubes, whereas G2, as all other Canadian reactors, have horizontal tubing. And the hydraulics, the bubbles, the vapour bubbles and everything compounded the positive nuclear reactivity coefficient problem that all CANDU reactors share. It just made it worse.

But if you would -- I would strongly urge you to follow this Mayday series that when an air crash occurs, you have all these agencies, especially the American one, the NTSB, that will take years, sometimes, to investigate thoroughly and find the cause of the accident.

And so it's important to know exactly why G-1 went wrong. Anyway, that's all.

THE CHAIRMAN: Okay, thank you.

MR. DUGUAY: Thank you.

THE CHAIRMAN: Thank you very much.

We've got to move on. The next presentation is by Candu Energy Inc. as outlined in CMD 12-M23.6 and 23.6A. I understand that Mr. Pilkington will make the presentation.

Please proceed.

12-M23.6 / 12-M23.6A

Oral presentation

by Candu Energy Inc.

MR. PILKINGTON: Good afternoon, Mr. President and Commission Members. My name is Bill Pilkington, and I am Senior Vice-President of Projects and Services for Candu Energy Incorporated.

With me on my left is Mr. Frank Yee, our Chief Nuclear Engineer, and behind me also on my left is Mr. Albert Lee, Manager of Physics, Licensing and Safety.

I will speak to you today about the robustness of the CANDU reactor design.

First, an overview of the CANDU design features. Note that 34 CANDU reactors have operated safely for over 700 reactor years in seven countries. The safety of all CANDU plants is continuously monitored by their operators and regularly assessed by their national regulators.

Furthermore, CANDU safety is subject to international peer reviews by organizations such as the World Association of Nuclear Operators and the International Atomic Energy Agency.

Key design features of the CANDU technology include natural uranium fuel, which eliminates the risk of recriticality events. A separate low temperature and pressure moderator surrounding the fuel channels is available as a passive heat sink, and as mentioned by Mr. Mark Elliott of OPG in his presentation, on power refuelling limits heat load in the spent fuel pool.

The design of the CANDU reactor is based on the nuclear industry safety principle of defence in depth. The application of defence in depth provides a series of levels of defence by incorporated -- incorporating inherent safety features, redundant qualified equipment and operating procedures designed into the plant aimed at preventing accidents and ensuring appropriate protection in case prevention fails.

Some of the safety features of CANDU technology include multiple physical defence barriers to contain radiation, which I will speak to in a later slide, two independent groups of safety systems, including two independent safety shutdown systems, two independent and separate control rooms, large volumes of water. The calandria is filled with cool, low-pressure heavy water which surrounds the fuel channels.

Additionally, the reactor vault or shield tank is filled with cool, low-pressure light water, which surrounds the calandria. And I'll show you that in a later slide.

The turbines are driven by a separate steam cycle. In the event of hydrogen gas accumulation, the potential hazard is mitigated by passive recombiners and/or igniters. Also, the spent fuel pools are designed to be operable for many days without additional water.

Finally, because CANDU reactors use natural uranium fuel, there is no risk of re-criticality in the spent fuel pool.

Redundancy and defence in-depth are the foundations of CANDU reactor safety. The design of CANDU ensures that key safety functions are available, reliable and effective to cater to all possible operating conditions and modes, including normal operation, operation during upset conditions and during reactor shutdown.

The key safety functions are to control the nuclear reaction, cool the fuel, contain radiation and monitor all important nuclear process and safety parameters.

For example, CANDU reactors employ a two-group separation philosophy. There is physical separation and functional independence between the two safety groups. A potential failure of a safety function in one group is mitigated by the second.

Also, there are multiple physical barriers between the fuel and the outside environment, including the fuel sheath, the heat transport system, the calandria tubes, the moderator in the calandria, the reactor vault and finally the thick concrete containment building.

There is redundancy in both power and water supplies. There are four sets of electrical systems and equipment, including batteries, to provide electrical power to place and maintain the reactor in a safe state in the event of an emergency.

Large volumes of water surround the reactor fuel and I will focus on this in the next two slides.

The CANDU design has the ability to use passive natural circulation, which was referred to in the CNSC staff presentation as thermal siphon, to cool the reactor in the event of a total loss of power. Furthermore, there are provisions to add additional volumes of water to further extend the cooling period.

The spent fuel pools are designed to keep used fuel cool for many days in the event of a loss of electrical power. Provisions are also available to readily add additional makeup water from external sources to cool the used fuel indefinitely.

Although the CANDU 6 reactor is shown here, natural circulation cooling is a feature of all CANDU reactors. Because the fuel in the reactor is at a lower elevation than the steam generators, natural circulation is an effective passive cooling process to remove heat from the shutdown reactor. The effectiveness of natural circulation has been demonstrated in operating CANDU reactors.

The fuel, shown in brown, heats the water in the fuel channels and buoyancy causes the less dense water, shown in pink, to rise into the steam generators. There it is cooled and becomes less buoyant and the cooler water, shown in light blue, flows by gravity back to the reactor.

The water in the steam generators, in dark blue, is heated to produce steam which is discharged through the main steam safety valves. The water in the steam generators needs to be replenished and gravity flow of water into the steam generators from the dousing tank at the top of the containment structure can continue to remove decay heat from the fuel in the reactor.

Further passive cooling of the CANDU 6 reactor is available from the large volumes of water surrounding the fuel.

The heat transport system contains 190 metric tonnes of heavy water and is the primary coolant for the fuel. An additional 210 tonnes of light water is available for makeup to the heat transport system from the high pressure emergency core cooling system. A further

2,000 tonnes of light water is available from the dousing system for makeup to the steam generators for natural circulation and for addition directly into the heat transport system.

As shown in dark blue, 240 tonnes of heavy water in the calandria surrounds the fuel channels. As shown in turquoise, 520 tonnes of light water in the calandria vault surrounds the calandria itself to provide additional inventory for passive cooling.

For the CANDU 6, in a station blackout, this large inventory of water is available for passive cooling. It assures the integrity of the reactor structures and the fuel allowing three days or more to establish long-term cooling.

For multi-unit CANDU stations, one of the principle lessons learned from Fukushima was the need to ensure that design and selection of equipment provide a high degree of redundancy and reliability to cater to potential common cause failures.

Bruce Power and OPG operate multi-unit CANDU plants. Multi-unit stations have some additional features enhancing safety, including numerous methods by which cooling water, electrical power and other services can be shared or supplied between reactor units, a large pool of staffing resources, maintenance facilities and equipment and availability of spare parts, a large interconnected containment volume bolstered by the provision of a sub-atmospheric vacuum building to provide added containment capacity if required.

CANDU reactors are designed for the specific external hazards present in their locations, including earthquakes, severe weather phenomena, transportation accidents and other man-made hazards.

Canada has low seismic hazards when compared to Japan and there is no possibility of a tsunami except possibly at Point Lepreau which is very well protected due to its location at a high elevation that does not require a seawall.

After the Fukushima event, the European Union commissioned a stress test for all European nuclear power plants, including the two CANDU 6 reactors at Cernavoda in Romania. The stress test was performed by a team of senior European regulators from Sweden, the UK, France, Hungary and Germany, to assess the reactor safety and the programs to address Fukushima lessons learned.

CANDU Energy, as the original designer of CANDU technology, actively supported the Romanian utility in responding to this review.

As mentioned in the CNSC staff presentation, the European stress test review resulted in a positive report for the Romanian CANDU reactors.

CANDU Energy has studied the CNSC Fukushima task force report and the action plan and we find both documents are well written and consistent with the findings and actions of other regulators.

For actions resulting in modifications to the regulatory framework, the CNSC's consulted a process for regulatory change will ensure that the resulting changes are effective in further improving the safety of Canadians.

CANDU looks forward to ongoing opportunities to interact with the CNSC in the implementation of its response to the Fukushima event.

In summary, based on domestic and international Fukushima reviews, the CANDU design has been shown to be robust and safe. CANDU Energy is fully engaged with domestic and international CANDU operators to support their review and implementation of further safety improvements.

CANDU Energy has taken all of the Fukushima lessons learned and results of national and international reviews to further improve the design of the enhanced CANDU 6 reactor.

Thank you.

THE CHAIRMAN: Thank you.

Questions?

Monsieur Harvey?

MEMBER HARVEY: First question; in page 10 of your presentation, just -- can you elaborate, what is a stress test?

MR. PILKINGTON: Bill Pilkington, for the record.

Perhaps I could ask Albert Lee to address that question.

MR. LEE: Albert Lee, for the record.

The stress test was a set of scenarios that the European regulators constructed to evaluate the robustness of the nuclear power plants in Europe.

The extent of the stress tests involved examining the ability of the reactors to withstand natural hazards, such as a seismic event, an extreme flooding event, an extended station blackout event.

And the purpose of the stress test was to identify whether or not there were any cliff-edge effects where the essential safety functions of the reactor could no longer be performed.

And having done that to identify what improvements could be made to improve the ability to cope with these type of events and to demonstrate that the reactor designs were sufficiently robust that they were unlikely to encounter any of these cliff-edge effects.

MEMBER HARVEY: Thank you.

Staff, what are we doing different from that here; we are doing the same thing and we just repeating what have been done there?

DR. RZENTKOWSKI: It was called stress test in Europe but in fact it was just the safety review of European power plants. The safety review focus on one accident -- an extended.

Blackout of the plant, combined with the loss of heat sinks. Another objective was to evaluate if there is any cliff-edge effects; that means that a small difference in the initial parameters can result in catastrophic difference to the consequences of the accident.

So they searched for those cliff-edge effects in order to identify the most critical gaps and closed them as quickly as possible, either through the design improvements or through mitigation measures.

What we have done in Canada was a very similar approach because we started with the evaluation of all external hazards, going beyond what we normally assumed as a part of the design basis.

So in fact we were looking for the cliff-edge effects outside of the design basis when we want to this beyond design basis domain.

And we also concluded that the best approach is to focus on one accident scenario which is limiting, which is critical, and this also proved to be station blackout and loss of heat sinks.

So we started slightly differently; we went through different steps but we arrived at exactly the same point.

THE CHAIRMAN: Maybe now is the time -- we heard staff, Mr. Schwarz, who was in Romania doing a CANDU and I understand Mr. Schwarz also read the plan.

So can we focus on a CANDU difference conclusion in Europe and in Canada? Why don't you come here and give us a one-minute…

MR. SCHWARZ: For the record, I'm Gary Schwarz.

It's basically much the same as Mr. Rzentkowski explained. I mean fundamentally the stress tests were defined as a targeted reassessment of the safety margins of nuclear power plants in the light of events which occurred at Fukushima.

So namely this was extreme natural events challenging the plant safety functions and leading to a severe accident. So what they did is they took -- and they first of all looked at the extreme natural events, seismic, flooding, weather conditions to see whether the -- what the plants were taken and assessed against and then how the plants would perform under much more severe conditions that what their initial design basis was.

And in doing that they took a look to see how would the plant perform in the case of station blackout and then in case of loss of all of their heat sinks as well.

And they were really looking for the margin, the safety margins of the plant, and they were looking for, as Mr. Rzentkowski said, the cliff-edge effects.

In other words, you would take the failures to the point where something catastrophic would happen at the plant, basically you would melt a core. And then what they did is they took a look at severe accident management.

So given all of these kind of situations occurring how could you manage these with your severe accident management guidelines.

So what were all the mitigating systems and equipment and so on in place to take and limit those consequences, so basically they did not get outside of containment.

So they went through this particular

approach with all of the reactors in Europe, which happens to be about 150 of them and -- including the two CANDU reactors at Cernavodă.

What this did then is this gave the CNSC a very good comparison between the results and the outcome of the European review, their so-called stress test, but as was described it's really a safety assessment, safety margin assessment and what we arrived at here in Canada.

And the outcome of it was very similar -- well, basically the same. And as has been described before in consideration of the different mitigating -- additional mitigating features that have been added in at Cernavodă, such as mobile generators, mobile pumps; the same kind of thing that we were talking about here in Canada.

The plant was judged to be a very good plant. And in fact, in one of the comments that they said in the peer review, they stated:

> "The robustness of the CANDU design to severe accident progression -- in other words slow accident progression due to the quantity of water available in the vessel and calandria vault, the impossibility of in-pressure core melt induced steam generator 2 rupture and

maybe steam explosion which maximises the chance to stabilize a degraded situation and limit the possibility of large early release."

This has been given as one of the positive aspects of the CANDU design.

THE CHAIRMAN: Again, really quickly, did they resolve the emergency management issue con-Europe?

MR. SCHWARZ: That has not really been a part of the EU stress test done so far. They have not really looked very much into the emergency response beyond the site. A little bit but not much.

When you take a look at the public comments that have come in about this and what they're saying now internally in the EU, I think you're going to see a lot more of that coming along fairly soon.

THE CHAIRMAN: Thank you.

Monsieur Harvey?

MEMBER HARVEY: Just one other question to AECL. It would have to be added or changed in the CANDU as we know it now, as it has been implemented.

To me the requirements that will follow the -- all the studies engage in the plant.

MR PILKINGTON: So I really can speak best to our reactor development program which is the enhanced

CANDU-6, which is the reactor currently under development, very similar to the CANDU-6, as the plants in Quebec, New Brunswick and in Romania and other place in the world.

And for existing plants the physical changes that are possible or that can be made are somewhat limited and there is complexity just in the process of making significant change to plant designs.

So for operating units, often the best solution involves using different response procedures, the idea of having dedicated equipment onsite and offsite.

In the case where you're in the process of designing a plant then there is the opportunity to incorporate more into the design itself. And if you wanted details I would have to bring forward somebody that I could from the audience.

But the point is that we are learning from the Fukushima event and for things like additional -- additional points to be able to add cooling water to key systems to be able to tie in electrical supplies, looking at providing more robust features around containment and post-accident monitoring, these are things that can be done in the design of a new plant and so those things are being done for the enhanced CANDU 6.

MEMBER HARVEY: Thank you.

MEMBER BARRIAULT: Just briefly, we've heard about the CANDU 6 reactors, but how about the older reactors. Has any stress test been done on those, anybody?

DR. RZENTKOWSKI: Greg Rzentkowski, for the record.

Yes, of course. Our safety review was applicable to all units in operation here in Canada. So we reviewed specifically Bruce units, Pickering units and Darlington and for each site we recommended specific actions.

What it effectively will mean is that most likely, some of those actions will be addressed by different means because we have differences in the design and also there are certain environmental stressors present on those sites.

MEMBER BARRIAULT: Thank you.

Does CANDU concur with this, that the older designs are adequate and robust enough to withstand any problems?

MR. PILKINGTON: So I'd ask Frank Guy, our Chief Nuclear Engineer, to comment on that.

MR. GUY: My name is Frank Guy, for the record.

CANDU Energy is a participant in the CANDU Industry Integration Team so we are following all the enhancements that the rest of the industry are putting forward, and we concur with all the direction of the team all the enhancements.

So we're as part of the team and this is one of the big positive features about the CANDU community and sponsored by COG. We make sure that we compare notes and we make sure that all these things are considered as a team, yes.

MEMBER BARRIAULT: Thank you.

Thank you, Mr. Chairman.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: So part one of the CNSC's action plan deals very much with defence in-depth and enhancing the robustness of the design. So would Romania's action plan look similar? Can you comment?

MR. PILKINGTON: If I was to provide a good comment to that, I would ask that one of my colleagues come forward, if you have the time. I would ask that Mr. Raidis Zemdegs, our Manager who's been responsible for participating in Fukushima reviews, if Raidis would come forward and address that question.

MR. ZEMDEGS: Okay, so the action plan for Romania and for the regulator is similar to the action plans that have been outlined by the CNSC, and it's not a coincidence that it's similar because the results from the reviews had similar findings or similar gaps that were identified in terms of these auxiliary equipment and emergency capabilities.

So the Romania regulator right now have not issued necessarily their final report because the report from the European Union is going to the European parliament at the end of June. But, yes, the action plans are very similar between the Canadian plan and the one that is set for the Romania regulator.

THE CHAIRMAN: Anybody else?

No, okay, we're going to take a biological break here for 10 minutes, coming back at quarter to.

--- Upon recessing at 3:34 p.m./
L'audience est suspendue à 15h34

--- Upon resuming at 3:46 p.m./
L'audience est reprise à 15h46

MR. LEBLANC: Si vous voulez bien reprendre vos sièges. We will resume in a few seconds. Thank you.

THE CHAIRMAN: Okay, we are continuing.

The next presentation is from Greenpeace, as outlined in CMD 12-M23.8 and M23.8A.

I understand that Mr. Stensil will make the presentation. Please proceed.

12-M23.8 / 12-M23.8A

Oral presentation by

Greenpeace

MR. STENSIL: Hello/bonjour. Good afternoon. Comme d'habitude, ma presentation va être en anglais, mais je suis content de prendre des questions en français.

To begin, I would like to frame my presentation with a personal anecdote which touches on a fundamental weakness of the CNSC's response to the Fukushima disaster; attitudes to risk.

In 2009, I attended a conference of the International Nuclear Law Association in Toronto. President Binder, you opened the conference. I don't think you're aware that I was there and perhaps you thought the room was just industry representatives. But in your presentation you discussed your, and I imagine the CNSC's, perspective on the precautionary principle. You said environmentalists want to use the precautionary principle, which you said means, quote, "Do nothing. We at the CNSC use ALARA or as low as reasonably possible."

I found this both disturbing and unfortunate to see the president of a federal responsible authority dismiss a tenet of Canadian law and implicitly the significant societal risks created by the industry the CNSC regulates. We use precaution in the face of irreversible harm.

Later at the same conference there was a presentation by a representative from one of the international nuclear insurance pools. He said, and I quote -- this is in 2009 -- "It's been over 20 years since Chernobyl and we [the nuclear insurers] are getting worried because you [the nuclear industry] are getting arrogant."

In retrospect, I see these two statements as a sign that the conditions were in place that a Fukushima-like disaster could take place somewhere in the world and unchecked dismissive attitude by both regulators and operators to nuclear risks. This is really what led to Fukushima.

In my presentation today, I will propose institutional and policy changes for the CNSC to minimize, not eliminate, the risk of future accidents. In a sense, I'm proposing a defence in-depth system for human hubris. This, though, is currently out of scope of the current CNSC Fukushima review and will need direction from the CNSC.

First, theory versus reality; the CNSC is not providing objective information on reactor risks to Canadians. While the Fukushima task force has continued to assert that the risk of nuclear accidents is acceptable and very low, the empirical record internationally tells a different story. Reactor accidents or meltdowns are happening approximately once a decade somewhere in the world.

The ***Nuclear Safety Control Act*** mandates that the CNSC disseminate objective scientific information. Such objective information would admit that the CNSC's theory of nuclear safety has not been confirmed by the empirical record.

When the facts change you should change your theory or at a minimum admit the facts.

A first layer of defence against future accidents, let's speak the truth. Reactor accidents are happening fairly frequently, not on a low probability, and they are accompanied by major societal risks.

As outlined in the Greenpeace International Report provided to the Commission, the Fukushima disaster was not caused by a freak act of nature or a black swan event but instead by institutional failures created by a dismissive attitude towards nuclear safety. The Japanese knew an earthquake and tsunami was coming. They were the experts -- world-wide experts in this after all. They just ignored it.

This highlights why the focus on defence ink-depth in the CNSC's Fukushima review is both inadequate and misleading. You don't solve human problems by pointing to all your technical blueprints, and you cannot claim to have solved the problem by pointing to all the efforts you've made to solve the problem, and that's exactly what we've heard today.

The problem isn't solved though. The problem is still there. Nuclear reactors that exist today are not inherently safe and meltdowns are happening regularly. Let's admit that.

Such an admission requires the CNSC to change the scope of this review of Fukushima. Greenpeace requests the Commission acknowledge that Fukushima was caused by human and institutional errors and not just a natural event or specific technical issues, which is the focus of defence in-depth.

Thus in response to the question you made of Mr. Duguay, Mr. Harvey, it's all well and nice but I think this review has actually missed the big issue and that needs direction from the Commission.

Such an admission would change the CNSC's response to Fukushima.

I'll now make a few proposals on where such a response could go if the Commission decides so. Let's call it defence in-depth approach to the vulnerabilities of human hubris that could -- the CNSC staff and licensees can be vulnerable to.

First layer of defence. A structural separation between the CNSC and the industry. We saw with the firing of former CNSC President, Linda Keen, how in industry profits conflict with safety, the industry wins. There were similar problems with regulatory capture in Japan.

Greenpeace requests that the Commission make a formal request of the government to move the CNSC from Natural Resources Canada, which promotes nuclear power, to the Ministry of the Environment. This is of no cost to the CNSC but would add credibility and a structural wall for some of these political issues that have already come up.

Second layer of defence. Let's start to provide objective communication to Canadians as well as yourselves on the risks associated with operating nuclear reactors. This requires a two-fold change in approach.

First, the CNSC should acknowledge the real-world track record or frequency of nuclear meltdowns in its risk communications and evaluations. And in the Greenpeace report, we actually cite a member of the Dutch nuclear regulators saying that we need to re-look at probabilities.

Second, the CNSC should consider not merely the frequency of accidents, because that's just part of risk, but also the consequence of significant reactor accidents. To my knowledge, there has never been a Canadian study of a catastrophic accident at a Canadian nuclear station. We get frequency, we don't get consequence. And that's not actually a full assessment of risk.

Relying on a simple theoretical and indeed speculative probability, the world hasn't really been around for 10 billion years, estimates without any consequence analysis distorts understanding of reactor risks for you and the public and I would say encourages risky behaviour. Objective risk communication would provide a second layer of defence for CNSC staff and operators from becoming too complacent.

A third layer; transparency and public participation. As I've said to the Commission in the past, Greenpeace believes a precautionary approach to nuclear safety uses public participation and transparency to ensure there's proper scrutiny and debate on nuclear risks. People in this room evaluate risk very differently from the public, and the head of the NRC in the States has made similar comments in the text on the screen.

The Commission currently ignores and withholds risk information. This leads to complacency. For example, since September 11th, there has been an increasing lockdown on information from the CNSC, and I've been following CNSC for about 10 years now, as well as operators. A Member of the Commission staff has even told me privately that they believe its safety margins have gone down since September 11th because they, as staff, are no longer getting as much scrutiny as they used to. Hard to prove but that's anecdotal.

The Commission, for example, has been supportive of the desire by licensees to sensor probabilistic risk assessments, carte blanche. OPG, for example, has denied Greenpeace outright PRA information over and over again, including source trem (phon.), which could be used to calculate consequence for the Darlington nuclear station, citing September 11th. I will make an assertion here. OPG's concern really isn't with terrorism risks. Its concern is the public having a fuller understanding of the fuller risk posed by its stations. And look, I've acquired a previous copy of the Darlington PRA from a friend's archives. This isn't dangerous information. It's mostly information about economic costs in the event of an accident. This is not the kind of thing that is dangerous for terrorists, but it's being withheld carte blanche.

September 11th is being used as an excuse to withhold information on potential economic and environmental consequences.

So President Binder, I disagree that you're holding back only information regarding security. There's a lot being caught up in that net.

Post-Fukushima, I ask the Commission to stop hiding behind September 11th. We need public transparency about risk to make sure there's continued vigilance to prevent or minimize the risk of future accidents. Public transparency and participation is an essential layer of defence, a reality check for CNSC staff and licensees that could live in their own eco-chamber.

In conclusion, Greenpeace requests that CNSC acknowledge the role that institutional failure played in causing the Fukushima disaster and expand the scope of its Fukushima response accordingly. We request that the CNSC admit reality. Our reactors aren't inherently safe and meltdowns are happening regularly. If the Commission accepts to acknowledge institutional risks as a cause of the Fukushima disaster as well as past accidents, we urge you to undertake new studies to address such causes. We proposed a number of ways in which this could be done to minimize -- again not eliminate reactor risks, those being regulatory independence, objective risk communication, and public transparency and participation.

And with that, thank you, merci.

THE CHAIRMAN: Thank you. Can we start? Mr. Tolgyesi.

MEMBER TOLGYESI: Mr. Stensil, in your submission, you are -- you are talking about -- you recommend a greater public participation as part of CNSC procedures. Could you be more specific; how do you see a larger public participation? What form is that?

MR. STENSIL: Well, I think part of it is opening up the scope a little bit. You know, often when we're brought in to these CNSC hearings, you know we're open to public consideration but only this much is really on the table.

Take environmental assessments. Over and over again, the public says, "we want consideration of severe catastrophic accidents within the scope of environmental assessments." The CNSC has told us over and over again, low probability. It's not within scope. Fukushima kind of changes that a little bit. So you know if you want greater public participation, first you need to open up a little bit more. Secondly, I think there's some room to actually engage NGOs and communities in ways that suit them. For example, under President Linda Keen, there was the Regulatory Affairs Committee for non-governmental organizations. We had a meeting several years ago and then we never heard back from the CNSC on that. And there were questions raised that were important for the Darlington new-build review, for example, and they were never followed up on. Just let go.

But I know meanwhile through access to information requests, for example, that usually when a regulatory guide comes out, the industry has been consulted beforehand. And we've come out for a pro-forma review that's pretty much already a fait accompli. And we haven't put the same work into actually consulting with other non-industry stakeholders than we did with industry stakeholders before we start these consultations.

MEMBER TOLGYESI: Staff?

THE CHAIRMAN: You were going to say something?

MR. JAMMAL: Ramzi Jammal for the record.

Just on transparency, there are a couple of things I would like to mention. Mr. Stensil's latest remark on cooking the regulatory documents on pre-consultation basis with the industry; that's not correct. As a matter of fact, the CNSC takes the sides of nobody here. We are on the side of the fact, and you can ask the industry now before we even publish a regulatory document or even before we come up with a regulatory document, we have a process in place that we are even thinking out loud on policy discussions before it becomes policy. Before the last -- since President Binder came onboard, he literally put a stop to this pre-consultation process and then the debate is in public.

So as you see, the disposition of comments, cycle after cycle, and the posting of the comments on comments has been the practice of the CNSC. And I will request from Mr. Moses, if he would like to add anything from that perspective.

But that's where we are. So we are -- the transparency that has been demonstrated even in this action plan, there's no regulatory body in the world that has put out the consultation process for, first of all, the report itself; second, the disposition of comment; third, disposition of comment on comments; and then the third from the External Advisory Committee and the RS Review.

MR. MOSES: Thank you. Colin Moses, for the record.

Yes, just to confirm with what Mr. Jammal said, we do have a very rigorous and transparent process for developing our regulatory documents. So if we're considering new policy direction, we'll issue discussion papers which lay out that policy direction that we're considering and invite comment from all interested stakeholders on that.

When we actually develop our expectations and regulatory documents, they're posted for a formal public consultation period. Any comments that are received during that consultation period are then posted on our web site, and feedback is invited on those comments.

The CNSC takes into consideration all comments received on our reg. documents as we work to finalize those documents.

So I think that our process for developing our expectations is very thorough, rigorous and transparent.

MR. STENSIL: Unfortunately, I have to disagree. Just take the Regulatory Guide 360. I've followed that guide for a long time, since Point Lepreau. When it was first put out in 2006, it had been predefined by what industry wanted. The revised guide that came out last year, OPG was already in the loop on that guide before it was put out for public comment.

And I think this is one of the frustrations for the public, when something seems to be predetermined and other issues are out of scope before you even go to consultation, it's not really a meaningful consultation, and people understand that.

One thing I would -- and, you know, a good example on this current Fukushima review, you know, we talked about the bounding around environmental assessments. I think there's one line that I cite in my written submission to the Commission on perhaps, given the probabilistic approach, is not quite following empirical reality. We need to rethink that approach to environmental assessments.

Well, there was a presentation done by CNSC staff in the summer, just after Fukushima, saying, "The bounding approach, you know, given what we've learned, is really not in question."

So staff have already made the decision beforehand, going out, that to them seems intuitive, but is not necessarily what the public's been talking about for a long time.

One other piece I would add to that, though, is there is a significant problem getting information from -- I work on this full time. A lot of other organizations in the country don't have the time to do FOI.

And the CNSC's regulatory approach, unlike the NRC's approach, is much more British. It involves correspondence between staff and licensees over and over again. That's really where a lot of decisions are getting made, and where you can see where something funny might be going on, it's really difficult to get that information.

For example, on the current life extension review for Darlington, if I want to get any submissions OPG makes to the Commission, I have to use provincial FOI, not CNSC FOI, to get a hold of the documents, because OPG says, "No, we're going to use our provincial exclusion. You can't have it." They're making it more difficult.

Those are the kinds of problems that the public is faced with.

THE CHAIRMAN: Go ahead.

MS. VELSHI: So, Mr. Stensil, just to follow up on that, because I think what you've heard from the CNSC is that they think they're doing everything possible to be transparent and inclusive in their process, and early this year the CNSC staff came in front of the Commission with a public disclosure program for licensees. And I don't know if you'd seen it, because I don't believe there were any comments submitted by you, a document which I would have thought would have been of fundamental interest to you because it imposes on the licensee what they should be disclosing to stakeholders.

And so when we asked the staff, you know, "What kind of a process did you follow through to make sure that this document had gone through the process of soliciting feedback," you know, it sounded like a very robust process.

So I'm wondering where the disconnect is? You certainly want to be a part of it; they think they're doing everything possible to try to get input, and it's not working. So any thoughts on that?

MR. STENSIL: Well, as I mentioned, there was the Regulatory Affairs Committee several years ago. The idea was -- and one of the proposals I recall at the time, four years ago, was that people would get a heads-up before these documents actually come out -- kind of like what the industry gets, so that people can be prepared to actually comment on that.

A lot or organizations have no financial resources to comment on this barrage of documents that come out, and then you suddenly have 60 days while you're trying to find time to do this stuff. So that would be one way of, I think, adapting and addressing that issue.

And, again, going back to -- the scope issue is a big problem, you know. Things that tend to be important to the public are often just scoped out of these reviews. There's a decision made somewhere else and it's never really on the table.

And, like I would say in the current Fukushima review, for example, as they said in the report, there’s a complete disconnect with the predicted probabilities that are used by the CNSC to say, “Reactors are safe; hat is, a meltdown will happen once in a million years.” and what we’re seeing. And there’s a cognitive dissonance that I don’t see being addressed.

And I think the Commission needs to give staff some direction to actually look at those issues a little more deeply.

THE CHAIRMAN: Dr. McDill?

MEMBER McDILL: Can we have a very brief repeat of some of the probability issues and risk issues that Mr. Stensil is -- Mr. Frappier gave a nice one, but I’m not sure if it can be repeated.

MR. FRAPPIER: Yes. Well, certainly in the last comment I was making, was on some of the way the probabilities are being put together, and certainly we, as staff, disagree with interpretations that assume that nuclear accidents are like rolling dice, or folding -- or flipping coins.

As I mentioned, if you use that frequent a statistic, it’s got to be on something that is repeatable, homogeneous, and that is not the case with nuclear power plant accidents, because nuclear power plants are designed differently; they operate differently, and the events that we're talking about are fundamentally different.

I don't know if you want me to illustrate the -- give you the simple example I gave again. I can do that, but I think on the bigger picture that's being talked about here is we do undertake many things that we believe quantify risk, in particular, the probabilistic safety assessment, probabilistic risk assessment, that is done. It's not meant to predict how often things are going to happen. It gives you a quantitative understanding of risk, which is a little bit different.

We also undertake deterministic safety assessments, and whatnot, which are -- and the entire review of the safety case to ensure that the plant is safe, no matter what event happens.

So that when we're looking at the events, it's not so much a question of managing risk at that point; it's a question of having engineering methodologies used to prove that certain things will not deteriorate into an accident situation. And that's how we manage that aspect of risk.

MEMBER McDILL: How can you -- let's take the quote out of -- I guess it was once every 10 years, for a meltdown, and one in a million -- these are hard numbers for the public to reconcile.

So there needs to be something that is helpful to -- Mr. Stensil said “the public” -- I mean, it could be NGOs, but whether one has taken a statistics course or not shouldn’t have a bearing on how it is understood.

DR. RZENTKOWSKI: Greg Rzentkowski, for the record.

I will try to respond. I think in a similar way I attempted already, during Point LePreau relicensing. We have to start a little bit, maybe philosophically that nothing in science is absolute. So that’s why we are talking about probabilities, percentages, we are talking about the confidence level, et cetera, et cetera.

And because of that, one can always find an argument to challenge the reason. However, we have to find the right approach to do it. As Gerry Frappier mentioned, the data has to be homogenous. When we look at all operating reactors, we cannot just put them into one group, because those are different designs. The level of safety is different. There were different design requirements used, and they were built probably 40 years apart. So there is a big, big difference to it; One cannot compare like that.

Nevertheless, if we extend this analogy to CANDU reactors, then we can conclude that the core melt probability is zero. Because there is 1,000 years of operation of CANDU reactors, and there never was an accident.

So, of course, we don’t want to over-simplify this, and that’s why we have sophisticated analytical models, probabilistic safety assessments or probabilistic risk assessments. And in fact, we attempt to predict, not only the frequency of core melt or large releases, but also the consequences.

Probabilistic safety goals are defined as a risk estimate, so there’s a probability and consequences given there. That’s a very important point.

And also, for existing reactors, the core meltdown currently is predicted to be 1 in 10,000 years or better, and for large releases 1 in 100,000 years or better. So those are the numbers used.

In addition I would like to mentioned that the probabilistic safety assessment is not truly a licensing tool. This is something what complements the deterministic analysis in order to identify weak points in the defence in depth of the reactor and respond to those observations. Because of course every layer of defence in depth is only as strong as the weakest point.

We have to identify this weakest point because the deterministic analysis is not good in that, that's why we use probabilistic tools.

I will stop here but you know I would also try to probably challenge this analogy to rolling the dice, if you want me to.

THE CHAIRMAN: Well, I think the point here is you got to find some simple way to describe this to the public and it's not the way it's being described by other people. So we've got to find some way of describing conditional probability which is a completely difference concept than what we hear here. Mr. Stensil?

MR. STENSIL: Yeah, I think this is one of those moments where you need non-experts to actually have a reality check, because what I just -- in response I don't think the staff responded to Commissioner McDill's question because they didn't respond to the Greenpeace report.

All the Greenpeace report states, and I'm not a mathematician, you know, it states an impuracle observation, there is a difference in magnitude between what we've been told when meltdowns will happen and how they're occurring.

So there's a difference between the theory and what's happening in reality and that needs to be resolved, and that has nothing to do with rolling the dice.

The nuclear regulatory regulator in Japan probably said the same thing at the beginning of 2011. We have low probabilities, defence in depth, et cetera, et cetera, but the accident happened.

And as the Greenpeace report states it didn't have anything to do with defence in depth, fell apart within 24 hours at Fukushima. And part of the reason -- well, the reason was institutional failure.

And if you look back through Mile Island and Chernobyl that in both of the reviews of those events was that that was the cause.

And this might be interesting for Commissioner McDill, because I think your background is in the aviation industry or maybe not, sorry. I thought it was, but there's a similar approach to risk in the aviation industry, although you don't have the same types of catastrophic accidents.

And the Greenpeace report actually cites a former ACB staffer, Mr. Waddington, in a paper that he presented showing that the nuclear industry and this is before Fukushima like the aviation industry; the leading contributor to risk is institutional failure.

There's only -- you can only reduce kind of accident sequences to a certain point with technical fixes, but you still see accidents happening. And so that was a former ACB staffer saying it, cited in the Greenpeace report.

What I would say is this, 20 years ago in this probabilistic risk assessment that I have, the ACB and Ontario Hydro did not include external events as contributors to risk in their PRAs.

Since that time it's been like, oh, geez that's a huge -- that's the major contributor to accident sequences, we need to include that.

I think the next step in acknowledgement that I'm asking the Commission to look at is institutional failures are the difference between the theory that's been put out there by staff next door and what's happening in reality.

And if you're going to be objective about it first say, this is what we theorized, this is what's happening, now let's figure out why it's happening and try to stop it.

And I haven't heard that response from staff and I think that takes direction for a change in the scope of this review. It's impuracle.

THE CHAIRMAN: Well, let me start by being shocked that you would consider the aviation industry not to have catastrophic accident. Every time there's a big 400 people died I consider it to be catastrophic.

And nevertheless I also consider flying safe. So you can have a safe instrument but accidents do happen and this is a different type of accident. So we can debate what is catastrophic what is non-catastrophic and how we calculate our risks. The only point that comes to me is nobody understands what the hell you're talking about really.

And that's what required some way of explaining the probabilistic analysis that are being done on some of those in the aviation business, in our own business. We haven't found a way of explaining the risks associated with this.

So I interrupted you. Dr. McDill?

Anybody?

MEMBER McDILL: I was just going to say that unless you've taken a statistics course you have no idea what a standard distribution is, for example. So that immediately makes it very difficult for the public to make a kind of understanding.

But I also think, Mr. Stensil, that lumping all designs into one big pile is perhaps doing a disservice to the very public that you're representing.

MR. STENSIL: We've had three different major accidents all with different designs. The MARK 1s had a similar amount of reactor year operation as the Candus before Fukushima happened.

So what I'm saying is, you know, the industry in Japan and around the world no matter the design using the same approach, one in a million for meltdown risk. If you apply that to 440 reactors operating in the world it's around 200 -- one accident every 250 years.

We're seeing it on a different rollout and we can say, oh, it won't happen with Candus, but I have a quote from the Ministry of Japan just two months before the accidents happened in Fukushima saying our reactors are the safest in the world. I think that gets into the hubris issue.

And all I'm pointing out here is there's a difference -- it's not just about explaining the probabilities it's about actually accepting something's not going the way we said it was going. There's a magnitude difference between what we were told was going to happen and what's happening.

So let's first accept that, admit it to the public and try to figure out why it's happening. And as I said in passed reviews and an analysis that Greenpeace did there's institutional causes, and that hasn't been looked at in the current review.

THE CHAIRMAN: Well, again, I don't agree with your premise. The whole idea of being here is accepting risks is inherent to this design and to this.

The question is how we mitigate against it?

So just because an accident happened doesn't mean that it's the same kind of accident. So a three mile accident is it different than Fukushima or Chernobyl?

What we are engaged around here is how to make sure that even if an accident happens how do we take everything we can into dealing with this in a mitigation sense.

Really that's what this hearing is all about.

MR. STENSIL: And I agree with you to an extent, President Binder.

Again I would just underline I think just saying, you know, Candus haven't had an accident therefore there won't be one. That leads us into the problem that Japanese had.

So again, I'm just pointing out.

THE CHAIRMAN: But if we say that ---

MR. STENSIL: And you could ask your staff if they actually -- typically to the Greenpeace report there is a magnitude difference between what we're told and what's happening internationally.

The second issue though is I think an important one to bring up, where like in the event that an accident happens we now need to be prepared for it, two years ago we weren't at that stage. You know, doing emergency planning for multi-unit reactor accidents, we were just told low probability we don't have to look at it.

And I think part of what the Greenpeace report is saying, and I'm asking you to do today, is take that to the logical extension. It's not only emergency planning that we should be looking at it's full consequence studies.

I think in the report I cite a statement from a former CNSC staff person saying, if you actually want to be doing your cost benefit analysis well you should finish the severe accident study so that you can actually properly make those calculations. Right now you only have one half of the equation.

THE CHAIRMAN: But again, sorry to interrupt you but let's be honest. You ask us to be honest, let's be honest. No matter what we do, is there any scenario which you will stand up Mr. Stensil and say, with that case I'm all with nuclear? Isn't your answer to the nuclear is shut it down because it's inherently unsafe?

MR. STENSIL: That is not in the scope of the citizen review.

THE CHAIRMAN: Excuse me, we just wanted to expand the scope.

MR. STENSIL: But I think, and, you know, you raise an important question and this gets around how people, you know, outside of this room calculate risk compared to just a mathematical approach to it is, you know, if you ask somebody, you know, you should assume this risk they're going to ask, well do we really need it?

And that's outside of the scope of the mandate of the CNSC.

I think again what I'm trying to say is when you use the word "safety" you're using it in a very specific sense. And what we're seeing worldwide is that theory of safety hasn't been borne out in the facts.

So I'm not asking you to shut down all reactors. The submission Greenpeace made was let's at least be objective about it and acknowledge what's happening worldwide and find out why; and that is not in the scope of the current review.

THE CHAIRMAN: But, okay, well let me just try to boil it down to where I see - since you quoted me in my perception of precaution versus ALARA. So let me clarify what I meant to say by that if I – I don't remember what I said but I know what I think about this.

This Commission is all about the precautionary principle. The only difference between your view of precautionary and our view is in the Greenpeace view with respect to precautionary principle and a nuclear is 'shut it down' because then it's absolutely safe, completely.

In our view we use precautionary to make sure that we recognize the risk and then we try to apply an ALARA to minimize the risk. And that's really the difference. And I, you know, I don't like you putting words in my mouth that I don't have any kind of a view on precautionary principle. I think the whole Commission mandate is to ensure the safety of people and environment et cetera. And we feel very strongly about this. That's why we don't care about the safety of the asset in a catastrophic incident. We care about what happen to the population and to the environment. And that's always been our view. And that's why we spend so much time trying to -- constant mitigation.

Anyhow, enough of my outburst.

Dr. McDill.

MEMBER MCDILL: I saw Mr. Jammal trying to make a comment. Can we try? I realize it's late in the day. Can we try and address this issue since Mr. Stensil's raised it and it's on the record now between apparent risk and the risk that's in the reports?

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

I'd like to make a couple of comments and then I'll pass it on to my colleagues who want to tackle this because the challenge here is – everybody now is talking about statistical and the risk. Mr. Stensil makes a comment about consequences in our action plan and the analysis that we have done to date is -- we did not stop with respect to say that's good enough. We said okay, here is the event. Here is the design and here is the mitigation measures. And we went beyond to say, if that mitigation fails, what is the consequence? Then looking at how can we stop the progression of the event, then we said okay, if the mitigation or stopping the progression of the event fails, what is going to be the consequences.

That's why you see the upgrades that has taken place upon the (inaudible) with respect to the filtered ventilation and the modification. So those were taken into consideration saying, "what happens if the failures occur"? Now how do you translate this to risk, potential risk and how do you communicate. That's the challenge we’re facing. I mean if at some – I agree with Mr. Stensil. Okay do we need a non-expert to try to translate this into a language the public will understand and measure? If we had the answer we could have done it a long time ago, and that’s where we need to take things into consideration.

But there is one thing I wanted to touch upon is the institutional control. In Greenpeace, Chapter 3, the report puts up some really good points. However, the conclusion which I disagree with from a benefit perspective because the institutional control and, again, it appears we’re pooling the Canadian regulator in the same pool as a Japanese regulator. I’m not being diplomatic here. I’m probably going to get in trouble but regardless, this is the fact that just lumping a group of things together and say, ‘hence everyone is unsafe’. That is not acceptable.

With respect to the CNSC, with respect to transparency of the CNSC, and when Mr. Stensil talks about that we engage with a licensee on inspection reports and so on and so forth – well the CNSC has internal audit and an external audit. We carried out assessment on enforcement and determined that the enforcement principle and the actions taken by the CNSC is adequate for the protection of the health and safety of the environment and the public.

But with respect to the risk and the language associated with the risk, I will call upon my colleagues if they have anything else to add, because I'm struggling with how to translate it.

DR. RZENTKOWSKI: It's definitely not a very simple way to express this using simple terms. So let me only remind you how this probability was calculated in Greenpeace Report. My understanding is that we have five accidents up to this point in time, and this has been divided by the number of operating reactors and that's how one arrives at a certain probability. Let's say one percent for the sake of argument. But if we extend the same methodology or the same analysis to CANDU reactors, then we conclude that the risk is zero because there was zero accidents over thousands years of reactor operation. Do we agree with this? No, absolutely not, because it's definitely too small database to make any meaningful statistics out of that.

And I would like to conclude further, maybe, as non-expert. I remember my first approach let's say, or introduction to statistics. I think it was in the sixth grade and I was very proudly presenting different sots of cases to my teacher. She said, 'you are good in math so mathematically speaking what you are doing here is good. But statistically you have to be very careful because' she said, 'between I and my dog, each of us has statistically speaking three leg's I would like to finish at that.

THE CHAIRMAN: Moves on.

Monsieur Harvey.

MEMBER HARVEY: Just a comment. I think we put too much weight on the statistic. While our objective here is not to play with the statistic but to be sure that despite the nature of the accident, that there will be no damage for the environment and for the public – the public will be protected. This is the main objective of the Commission here. So I don't mind the nature of the accident, but I want to be sure that in Gentilly, for example, that if the accident arrive tomorrow or in one week, or is one year, we'll be ready, and there will not be too much damage. There'll be some damages I'm pretty sure around the plant, but -- well this is the way I see my task here – to take all the means in order to minimize any kind of accident.

THE CHAIRMAN: Go ahead.

MR. STENSIL: Thank you Commissioner Harvey, and you raised an interesting point and I had the slide up with the quote from the Chair of the Nuclear Regulatory Commission in the United States and he makes an interesting point which is – according to the NRC rules, Fukushima would have been an acceptable accident 'cause there was no immediate deaths. The end points that we're looking for or that are currently used in regulation are different from perhaps what the public would see as a significant event. And what he said to the industry in the United States is, "you guys need to think about that". Because what's happened at Fukushima is not an acceptable accident, but it currently is the way we're considering risk.

And I was in Japan last year. It's a mess. And there was no direct deaths, radiological deaths from Fukushima, yes. But that society has been severely impacted. And so I think there is some room to reconsider and that's why I was talking about – let's look at a severe consequence study. We've never done that here. So we actually have – it's not just arithmetic because we know – I think one of the things that I took away from the statement that 'we have not enough data to actually make projections' – we don't have proof then. You know, if we only have 700 reactor years, you can't safely project into the future that an accident won't happen either, 'cause that's just what Japan said last year with the same number of reactor years.

So we should be looking at both sides of the risk equation because frankly it’s not merely speculation when you’re talking about a million or a billion years -- it’s frankly ignorance.

THE CHAIRMAN: Anybody else?

Okay, thank you. Thank you very much for this intervention. We got to move on.

I understand that for logistical reason, we’re trying to accommodate a slight order here, and the next presentation is from CCNB Action, Saint John, Fundy Chapter as outlined in CMD 12-M23.10 and M23.10A and I understand that Ms. Sharon Murphy will make the presentation and she is online.

Can you hear us?

Ms. Murphy?

MS. MURPHY: Yes, I can hear you.

THE CHAIRMAN: Go ahead, please.

12-M23.10 / 12-M23.10A

Oral presentation by

CCNB Action, Saint John

Fundy Chapter

MS. MURPHY: Thank you, Mr. President, esteemed Commissionaires, fellow intervenors, ladies and gentlemen.

Today we, the licensees and affected stakeholders, are attending this Commission meeting to discuss the actions required by the CNSC to address the task force recommendations and the outcome of the public consultation on the CNSC Fukushima Task Force Report and the CNSC management response to that report.

Our community group, the CCNB Action, Saint John Fundy Chapter, has been extremely concerned that the problems that led up to the ongoing disaster in Japan are reflected in our own nuclear industry and local nuclear power plant.

Some recent reports serve to highlight many of the problems we identify in our written report but when we dug deeper, we found unexpected similarities that impress upon us in a serious way that we must learn from Fukushima and not repeat a made in Canada Fukushima.

The external advisory report; we were glad to see the report by the external advisory committee to the CNSC. We feel that the concerns are legitimized. Our concerns are legitimized by the fact that they are echoed in this report.

Why are our concerns being taken so lightly by the CNSC and why is the Point Lepreau restart being pushed forward before all the studies are complete? We suspect this is due to the amount it costs to refurbish it but do not believe this is a safe way to run a nuclear plant.

Emergency preparedness; the external advisory committee reported that Canada has not handled the ongoing emergency in Japan well. In particular, they note that there is a lack of coordination of emergency planning rolls in Canada with regard to nuclear events.

The spent fuel pools at Fukushima are severely damaged and if another earthquake or tsunami drains or collapses these pools it is estimated that over 85 times the amount of radiation release from Chernobyl could be released into the atmosphere.

The emergency at Fukushima is far from over and we see a report that we aren’t handling it well. Why aren’t we dealing with these very possible risks to Canadians? We want to know who is responsible for informing the Canadian public of the ongoing risks from Fukushima. Is it the CNSC?

Why is Canada not preparing for this by developing plume models, preparing to secure and monitor food supplies, stockpiling potassium iodine for all the people who might be affected by the plume?

Why is Canada not, and for that matter the rest of the world, not helping Japan fast track the removal of the spent fuel from these pools?

Why do we have to get information on these risks from sources outside of our own government?

Since 2007 the CNSC has increased its spending on information technology consultants by a factor of five and spent over $10 million this year alone on IT, yet we cannot go to their website to get information on the ongoing risks to the Canadian public from Fukushima.

Locally, for Point Lepreau, were an emergency ever to happen here we know we'd be just as confused and misinformed as the Japanese were and are. Point Lepreau fails in its emergency preparedness planning and is going to be allowed to run regardless. This is totally irresponsible and should not be happening.

Human and organizational performance or safety culture; safety culture was identified in the external advisory report as being absent from the assessment of the lessons we have learned from Fukushima.

We don't feel this should have been missed, as our group, and many other stakeholders commented on this issue through the public consultation period for relicensing Point Lepreau and in the written submissions for this meeting.

The fact that the action plan did not address safety culture is in itself a sign of poor safety culture. This was a lesson learned from Chernobyl and

Three Mile Island, yet the nuclear industry still seems to have major problems remembering that humans potentially perform very poorly.

An example of this is that the IAEA IRR mission did not mention this deficiency in the CNSC action plan. We are not surprised that it took an external advisory committee from outside the nuclear industry to point this out, as it does go against human nature to be self-critical.

Safety culture issues have shown themselves in the Canadian nuclear industry in the past. One example of this is a situation that prompted the resignation of Alan Cupsis (phon.) and the subsequent shutdown of seven reactors in Ontario. It was not the CNSC but again an external review which found some very serious safety issues.

An interim parliamentary report entitled "Canada's Nuclear Reactors: How Much Safety is Enough" says that the regulator figured out in the last few years that culture, the structure of thought in an organization, turns out to be the key to whether reactors are run relatively safely or relatively unsafely.

It appears to us that all of the CNSC staff have not actually figured this out. By not including it in the action plan they have neglected to identify, study, and learn from Fukushima in a meaningful way, setting us up to repeat mistakes again and again.

It is known that when there are human performance issues, the culture of safety disintegrates.

As well, a critical lesson that should have been learned from the Chernobyl disaster was that a culture of safety did not exist at that plant. The blaringly obvious lack of safety culture at Point Lepreau should put up red flags for the CNSC. Instead, the entire issue was neglected and ignored.

The external advisory report also reported that in France the contractors were now being audited for safety culture. If this were to happen in Canada the government might notice that the contractor, SNC-Lavalin, CANDU Energy, has managers and executives in jail in other parts of the world for criminal activities.

Recently the RCMP raided their head office in Montreal. Yet, they are welcomed into our nuclear facilities, trusted with nuclear materials in our communities and basically given free rein to gamble with our lives.

We believe that all nuclear contractors should be bonded and criminal free.

In the Fukushima accident, the public was not properly notified as to the severity of the situation.

In our written report, we point out that there are instances where NB Power fails to report events. We understand the S-99 reporting requirements directs them to do so. This situation lowers our confidence that NB Power will notify the public of any potential health and environment risks if an emergency situation arises.

Another situation that has recently come to the attention of New Brunswick citizens is another example of poor safety culture at Lepreau. AECL and NB Power have launched a lawsuit against Lloyds of London for the delays at Point Lepreau due to the leaking calandria tubes fiasco.

Lloyd states in their defence that NB Power recklessly and wilfully agreed with AECL to continue to install new calandria tubes in the face of known leak test failures, and NB Power ignored expert engineering advice and breached its policy obligations to minimize loss or damage.

And on February 3rd, 2010 the AECL office of the chief engineer recommended to the refurbishment project team, comprised of both NB Power and AECL personnel, that calandria tube installation be immediately suspended.

It is a major concern to us that NB Power and some AECL staff are willing to risk safety in order to keep on schedule.

Chris Rouse, our Chapter’s technical advisor, is a professional project manager and stated to us that it is common knowledge that when a project is constrained by schedule and budgets that quality will suffer.

Workplace bullying; at Point Lepreau we have learned that there exists an epidemic culture of bullying with 29 separate complaints lodged with Bullying Canada over one reporting period.

Again, the culture of safety suffers when the culture of workplace bullying exists.

Obviously, from the amount of recent calls, just because Point Lepreau has a program in place for workplace harassment, it isn’t necessarily effective. As well, just because there are only a few reported internally does not mean it is not more widespread.

We request that the CNSC launch a full investigation into the alleged bullying at Point Lepreau.

What if people are being bullied into not making waves about safety or doing their job properly? This could pose a very large risk to the public.

We also request that an externally led anti-bullying program be implemented immediately at Point Lepreau that is mandatory for all managers.

Yesterday, we received documents through the ***Right to Information Act*** which raised some new concerns for us. One of these documents titled "Supplemental Information Supporting NB Power Nuclear Seismic Related Technical Assessments" dated February 14th, 2012 is from NB Power trying to address questions and concerns that we have had since the Point Lepreau licensing hearings in December.

Our group is actually mentioned in this document, yet, despite NB Power's required public information program we had to get this document -- which we did not even know existed -- through the ***Right to Information Act***.

Once again this shows that just because there was a program in place it is not necessarily effective.

Again, transparency of NB Power and the CNSC is severely lacking, in that we did not receive this document from either NB Power or the CNSC.

Upon review yesterday we found this document has many problems and actually outlines many of our concerns in our written submission.

One of the main concerns in this document is that NB Power states there is no requirement for the PSA-based SMA to meet its core damage and large release frequency goals.

In an email sent yesterday to NB Power and the CNSC we attached a letter from K. Lafreniere, the Director of Point Lepreau Regulatory Program Division, this is a person authorized who states:

> "NB Power will have to give confidence that the contribution of seismic events is low and that the plant meets its core damage and large release frequency safety goals."

This is an official condition from a person authorized under Section 5.8, footnote 1 of the S-294 Standard.

This is a regulatory requirement before the CNSC will accept the PSA-based SMA methodology. Therefore, there is indeed a requirement for the PSA-based SMA to meet its core damage and large release frequency goals, contrary to NB Power's stance.

As well in these documents we received yesterday, there is a correspondence about the proper method for the extrapolation of the hazard curves and is a median or mean curve should be used for Bob Kennedy's calculation.

Given that the hazard curves used are out-of-date and only consider a maximum earthquake of 6.0, not of 7.5 like John Adams stated is used for the National Building Code, this is a moot point.

We have done the calculation using the mean and median data directly from the NRCan model in which no extrapolation is needed.

This calculation shows, using the best available data to date, that Point Lepreau does not meet its safety goals; using either the median or mean curves.

Why isn't the CNSC insisting that NB Power redo these calculations using the best available data?

Also, in the NB Power document it states that there is no requirement for them to compare their safety goals to that of new plants. If however RD-360 had to be fully implemented into their license instead of just the return-to-service portion of it they would have had to do this comparison.

This highlights our concerns that all regulatory documents should be adhered to, not just the convenient portions of them.

Emergencies and disasters do not adhere to one part of a license, they simple occur. We are gravely concerned that in order to save face and keep up jobs and nuclear plant sales and service contracts the rules and facts are being altered with little regard to safety and reality.

When your own Jammal said in a recent public statement that “the core will definitely not melt down in a given situation” we wonder if he has the crystal ball that was used at Fukushima.

Tsunamis; up until recently we were confident that a tsunami would not threaten Point Lepreau. However, we have changed our opinion significantly with the recent new knowledge of a new swarm of 11 separate earthquakes on the continental shelf southwest of Nova Scotia which is directly offshore from Point Lepreau, as opposed to being off of Nova Scotia, sheltering Lepreau.

Our chapter has sought out expert opinions on the possibility and probability of a tsunami being generated in that area that could affect Point Lepreau.

With the knowledge we now have we feel responsible to make sure you are all informed of this new information.

We will be happy to forward all the email correspondence in this regard to the CNSC and NB Power. Indeed, we have already taken the liberty to forward our email correspondence between the chapter and experts on this topic. If requested we will do so again however, now that we have noted this information formally at this meeting.

A few of the new notable information that we now have includes, number one, the reoccurrence of the 1929 Grand Bank size tsunami happening in this area is around one in 20,000 years;

Number two; the last tsunami in this area was around 20,000 years ago;

Number three; an earthquake of a magnitude 6.5 or larger in this area could cause a tsunami event;

Number four; the annual reoccurrence of a 6.5 magnitude earthquake or larger in this area is about one in a thousand years;

Number five; there is a large deposit of sediment on the edge of the shelf in this area;

Number six; the wave run-up of a tsunami is usually much larger than the wave run-up created from a hurricane. A tsunami wave would not be bound by the effects of hurricane-induced waves of similar size and should be modelled differently.

And, number seven; although the average grade of Point Lepreau is 45 feet above sea level the side closest to the emergency generators, filtered vent stacks, and the secondary control room is only about 25 feet above sea level.

Finally, this morning at the beginning of this meeting President Binder asked what the status was on the site-specific seismic hazard study. The CNSC answered that they thought the study was already done as part of the PSA study.

For the record, Mr. President, that is not an acceptable answer. The seismic hazard study must be done in reality not through fancy math calculations.

These calculations are not based on anything real; they are calculated using old numbers, not present day NRCan numbers.

No one actually knows what is really going on seismically as the tests in other site-specific examinations have not been done.

We do not believe that the plant should be turned on until we know in reality that it is safe from earthquakes and now tsunamis that will happen in our area and human inadequacy for that matter.

We also would like to repeat that the ---

THE CHAIRMAN: Can you please -- can you please ---

MS. MURPHY: --- this morning should be calculated ---

THE CHAIRMAN: Excuse me.

MS. MURPHY: --- up to date NRCAN ---

THE CHAIRMAN: Woohoo -- can you please ---

MS. MURPHY: Yes, I'm almost done, sir.

THE CHAIRMAN: --- wind up.

MS. MURPHY: I have a half a page.

THE CHAIRMAN: Half a page is too much.

MS. MURPHY: A mean level, the medium curve and following instructions provided by the calculations author.

So finally we request that Action Item FAI 1.3.1, and Action Item FAI 1.3.2 be considered open until Point Lepreau has given -- has proven it meets its large release frequency goals, including seismic risk.

We also request that Action Item FAI 2.1 remain open for Point Lepreau until the seismic risks for Point Lepreau are independently reviewed.

SAI 2.1 should also remain open until site-specific seismic hazard studies are complete, with the risks recalculated, including the new information we have gathered on tsunamis.

In closing, the CCNB Action, Saint John Fundy Chapter would like to quote the Parliamentary report for the Pickering restart.

> "A safety culture is responsible as to whether a plant is run safely or not."

Thank you very much.

THE CHAIRMAN: Thank you.

Question; Dr. Barriault?

MEMBER BARRIAULT: I was the one who asked the question on seismic exploration this morning. And are you prepared to answer that question now?

MR. JAMMAL: For the record, it's Ramzi Jammal.

It's the -- as the action plan was being drafted and the Fukushima early lessons learned was being known, so we did request NB Power to conduct the seismic evaluation.

And I was informed this morning, as a matter of fact, that the preliminary results will be coming before the end of the year, towards the end of this calendar year, from that perspective.

So this is the site evaluation -- seismic site evaluation that the -- the non -- like the actual ground boring so on and so forth.

MEMBER BARRIAULT: The actual seismic exploration of the site?

THE CHAIRMAN: We have NB Power people here.

MR. JAMMAL: They are present in the room.

THE CHAIRMAN: Can you please come forward and we can hear directly?

There's a lot of things that have been said, I'll give you a minute to…

MR. KENNEDY: Yes, Mr. Chairman, for the record, my name is Blair Kennedy, I'm the Vice-President of Nuclear and the Chief Nuclear Officer.

I have with me Rod Eagles who is the Refurbishment Director and the Deputy Chief Nuclear Officer and behind me I have Paul Thompson, who is the Manager of Regulatory Affairs, and I also have Derek Mullen who is the Special Advisor from a point of view of nuclear safety.

So I would like to confirm that from the point of view of the specific seismic analysis we have contracted with a consultant to perform the site-specific seismic analysis.

We have placed an order -- we have an indication that there will be some preliminary assessments available by the end of this calendar year, 2013. Sorry, 2012, for the record.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: Yes, thank you.

Is there any reason for the delay; is it because of the contracting system?

MR. KENNEDY: No, the order has been placed. It's just a matter to actually perform the actual -- the actual testing and the analysis of site-specific to get the necessary data and to perform the analysis.

MEMBER BARRIAULT: Thank you. Thank you

Mr. Chairman.

Next question to CNSC. One of the questions that the intervenor asks is to cool down a CANDU nuclear reactor, what is the rate of cooling it down? She mentions that the operation of the valves apparently was a problem with Fukushima in the cooling process. It's Item 3.13 on page 25 of her intervention.

MR. JAMMAL: Sorry what was the page number again?

MEMBER BARRIAULT: Page No. 25 of the intervenor's presentation, and it's Item 3.13.

Okay. Let me read it.

> "What is the specific rate of cooling down for CANDU reactors? Is there a need for the operation of valves using natural convection circulation to maintain this rate of cooling?"

DR. RZENTKOWSKI: I will ask Mr. Phil Webster, Director of Darlington Regulatory Program, to respond to this question.

MR. WEBSTER: Thank you, Dr. Rzentkowski.

The normal rate of cool down after a reactor shutdown is 2.8 degrees Celsius per minute. That's the normal rate per minute. It is possible to cool down faster, but that is the normal rate.

MEMBER BARRIAULT: Thank you.

DR. RZENTKOWSKI: But coming back to the second part of the question -- Greg Rzentkowski for the record. Yes, natural circulation is required in order to extract the heat from the reactor core.

MEMBER BARRIAULT: And there's a system of valves that have to be open and closed?

DR. RZENTKOWSKI: There's a very simple action, which has to be credited because -- sorry, for the first seven hours, no, there are no valves. Natural circulation would simply start because of the gravity difference, cold water in the steam generator versus the hot water in the reactor core. For seven hours, there's no action.

MEMBER BARRIAULT: Thank you. Thank you, Mr. Chairman, that's what I was looking for.

THE CHAIRMAN: Okay. Anybody else? Ms. Velshi.

MEMBER VELSHI: Question for Ms. Murphy. I'm kind of overwhelmed with all the things you covered, but getting to the CNSC's action plan itself, it was hard for me to pull out from all that you had said, what are your specific comments on the action plan, particularly given that the External Advisory Committee's recommendations have now been incorporated; so items like human and organizational factors, communication, and so on have now been included in the action plan.

Can you just try to help us in narrowing down where do you see the big gaps in the action plan?

MS. MURPHY: Yes. Can I please refer this answer to our Technical Advisor, Chris Rouse, who has studied the action plan in quite major details?

MEMBER VELSHI: Certainly.

MR. ROUSE: Hello. Chris Rouse, for the record.

One of our major concerns is the lack of safety culture that we seem -- see happening at Point Lepreau with CNSC staff. It really, really, really concerns us. As well as in the External Advisory report, there's a number of things that are closed for Point Lepreau. And these things that are closed are for the release of radiation, which they put "not applicable". We're not even sure what 'not applicable' means yet. Also, the external events is considered closed, but we haven't even done the study yet. We have earthquake studies that don't appear to be done right.

You know, it seems the process seems to be fine, but it's the details that we're concerned about.

MEMBER VELSHI: So let me just recap what I think I've already said. You're okay with the process.

You're okay with the actions. You did mention something about safety culture, maybe not, being highlighted but then your big question seemed to be the status for Point Lepreau. And perhaps we can get someone to talk about the specifics that you have concerns with and either have Point Lepreau or the CNSC staff respond to that.

MS. MURPHY: Okay.

THE CHAIRMAN: One to staff and Point Lepreau.

MR. KENNEDY: Yes. First of all, I'd like to emphasize that New Brunswick Power and Point Lepreau Station safety is the number one concern from our point of view at the station. It's demonstrated by the fact that we did, indeed, do the right thing when it comes to the refurbishment. We, along with the prime contractor, went and did the right thing by removing the calandria tubes and ensuring that the calandria tubes were installed properly. So from that point of view, I want to correct the record.

But there is also an issue with respect to a lawsuit that is ongoing between New Brunswick Power and a group of ensurers, where we are in the process of recouping -- to attempt to recoup some money. So I would prefer not to speak too much in detail, but I can assure you that the calandria tubes that were reinstalled at

Point Lepreau and the process that was used meets Canadian nuclear standards.

To that effect, we have just completed an air hold test for the -- the primary heat transport system. We are filling the primary heat transport system as we speak here today. We will be doing a hydrostatic test. The initial tests from a hydrostatic -- from a air hold test showed no indication that there were any leaks. The tests will be, as we move forward when we use the hydrostatic.

Also, I would like to state from a company point of view, we basically put a big emphasis on a respectable workplace. From a point of view of harassment in the workplace and bullying, we are concerned about it. We've had a number of discussions with a proponent of anti-bullying, but we have all processes in place within N.B. Power where people can come forward. We respect the confidentiality of the employees. We have an internal ombudsman, and we also if they have issues, we look and review the issues with respect to third parties, third party review.

So I want to clear the record on that. We're not -- we do investigate all claims that we know about when they're brought to our attention. I do not know the number of events that they're speaking of in this presentation. I'm aware of some but none to the number that has been referred to here today.

From a point of view -- so I just want to set that straight, that safety, safety culture, safety -- -- everything we've been doing at Point Lepreau from a safety point of view is built in our day-to-day and from a careful point of view when we restart that unit.

THE CHAIRMAN: Can I jump on the bullying. The intervenor was very direct and strong about the bullying. What I'm trying to figure out, we do some human -- we do some fitness for service and human factor analysis on the plant. And one of the things we do normally is talk to union members, et cetera, et cetera. When was the last time we've done this in Point Lepreau and what were the results? And would such bullying environment go undetected? Staff?

DR. RZENTKOWSKI: Greg Rzentkowski, for the record.

First of all, on the safety culture, I would like to mention that the CNSC pioneered in implementation of safety culture assessment internationally. As a matter of fact, Point Lepreau was the first site being assessed, and the first assessment has been done already in 2001. Kathleen Heppell-Masys, who is the Director General of Directorate of Management

Systems, will describe this in more detail.

The second part of the question was our interaction with the union. It is our normal practice that the site supervisor meets with the union representatives at least twice per year.

THE CHAIRMAN: At that time, if there was such issues, would that likely to come up?

DR. RZENTKOWSKI: It would have been reported to our site supervisor and addressed through our normal enforcement actions.

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

The CNSC requires licensees to have management systems in place. The management systems are an organization that's expected to develop and implement a management system that foster the safe operation of the nuclear power plant and all work activities. Therefore, safety culture is a primary concern.

Now, we have done an organization and management assessment with all our licensees, and I can confirm that safety culture exists at all nuclear Canadian facilities.

CNSC has years of experience in this area dating back to the mid 1990s. The CNSC then integrated the safety culture characteristics and associated performance objectives into safety culture assessment method known as the organization and management method.

The CNSC used that method to evaluate the safety culture at 11 nuclear facilities, including all nuclear power plants, over the period of 1997 to 2009.

A major finding from these 11 assessments was that safety culture characteristics were present at all facilities, and these are: safety is a clearly recognized value in the organization. Accountability for safety in the organization is clear. Safety is integrated into all activities of the organization.

A safety leadership process exists in the organization. Safety culture is a learning -- safety culture is learning driven in the organization.

So in Canada, we have been very active in the -- with regard to safety culture. We will soon be publishing a discussion paper, actually, to -- in that regard to further improve the understanding around this topic and to also emphasize CNSC's role in getting licensees to engage in fostering a healthy safety culture in the organization.

Post events of the Chernobyl accidents, the safety culture nomenclature was -- then started to be used, and that is when -- that is further on we started using the terminology of safety culture in developing this

O&M method that I referred to.

It took years of studies and analysis before the Fukushima event to come to the organizational aspects of that incident. We expect that if -- with further analysis we'll find out more about what happened in Fukushima, but we're not quite there yet.

Thank you.

THE CHAIRPERSON: Ms. Velshi?

MEMBER VELSHI: So I'd like to come to the specific action items and the ones that you have concerns with that have been reported as either not applicable or closed for Point Lepreau.

Perhaps you can help us and navigate us through the action items or pick a couple so we can get some discussion on that, please.

MS. MURPHY: Yes. Before I do that -- I'm just finding that information on my computer right now.

Before I do that, I would just like to make a point that Bullying Canada did, indeed, received 29 complaints and they were varied. Some were managers picking on staff, some were staff picking on staff. It was all over the place.

There's a lot of concern and, indeed, emergency preparedness is not together in any way and did fail for Point Lepreau, so it's really nice that you're saying these things, but as the Greenpeace representative did point out, reality on the ground is different than what you are saying.

And when it comes to safety culture, that's not acceptable and we do believe that the CNSC has to go deeper. They do need to have external training. It cannot be any longer done in-house. And we are very sure of this situation.

So regarding the action items, I'm going to give you back to our technical adviser, who is very familiar with these items.

MR. ROUSE: First of all, it's FAI 1.3.1.

MEMBER VELSHI: Which is shown as not applicable for Point Lepreau?

MR. ROUSE: Yes. And this is the one where when seismic hazard is included in Point Lepreau's PSA, they're not anywhere close to where they're saying that they are, this one in 100,000 years, these modern standards that they say that they're meeting. They're only 34 percent of them using a mean curve, 60 percent using a median curve using the latest data.

This report that we got yesterday from NB Power through the ***Right to Information Act***, they're using this old, outdated seismic hazard curve that only considered a 6.0 earthquake. John Adams just said about an hour ago, they consider 7.5.

And we don't even know what "not applicable" means, I guess.

DR. RZENTKOWSKI: Greg Rzentkowski, for the record.

Actually, there is some level of confusion here because this particular action item relates to emergency containment filter venting system.

This system was installed to protect integrity of the containment under accident condition where the containment is over-pressurized. Basically, it's to provide controlled emergency venting of the containment following the unlikely event of a severe accident.

This action item was closed because this particular item was included in the scope of refurbishment activities. And the system has been already installed.

MR. ROUSE: Yes, I agree with that, but the limiting factor in your large release with seismic events is the other ventilation system, the building interaction that we've heard from the Day 2 hearings. This is not up to snuff.

Radiation will go through the least -- path of least resistance. It will not go through the filter. These other vents are cracked.

DR. RZENTKOWSKI: I under ---

THE CHAIRMAN: Okay. I think we're not going to go through each item here line by line. This is -- there's ample opportunity to go through the annual updates here.

Ms. Velshi?

MS. MURPHY: Well, indeed, these action items are specific. We have pulled them out after a thorough examination, and these particular ones we are very troubled by because it's not applicable and closed for Point Lepreau, our local plant.

THE CHAIRMAN: We got your -- I think staff got your input in there and they'll follow up on it in updating whatever we get out of these proceedings.

Anybody else have any question here?

I think it's time to bring the emergency planning for Point Lepreau.

MR. ROUSE: Okay. Can we please talk about RD 152?

THE CHAIRMAN: Excuse me. Can you not interrupt me, please?

I just invited emergency planning for New Brunswick to comment on -- you know, there was a statement made about nobody knows where potassium iodine being distributed and I think in the intervention there's a comment about siren, lack of awareness.

Maybe he can give us a little quick review as to the status of emergency planning around Point Lepreau.

MR. MacCALLUM: Thank you, sir. For the record, my name is Greg MacCallum. I'm the Director of New Brunswick Emergency Measures Organization.

I listened very attentively to that rather long list of observations here, but I'll just concentrate on those that -- over which I have some influence and control.

I take some issue with some of the comments such as "nobody knows" where such things are as KI stockpiles. In the provincial plan, which is distributed throughout government and is also shared with NB Power and is -- will shortly be put on our own website, the New Brunswick Emergency Measures Organization's website, the plan will be a public document, there is an annex in there that delineates where 110,000 KI pills are distributed throughout the southern area of New Brunswick.

And that doesn't even include the fact that within the emergency planning zone, virtually every residence has a supply of KI pills provide to them.

So if you ask anybody in the health industry in southern New Brunswick about KI pills, they

MEMBER BARRIAULT: Okay, thank you.

DR. EDWARDS: At the present time even the proposed liability limit is so low that there's no reason to have legislation at all really. If those were the only offsite damages that were done, a regular insurance policy could easily handle it.

THE CHAIRMAN: Okay, thank you. Anybody else? Anything else on this?

Okay. Thank you, Dr. Edwards.

DR. EDWARDS: Do I have a right of a final statement?

THE CHAIRMAN: Please do.

DR. EDWARDS: I would like to add about that I'm sorry to say that there wasn't sufficient attention given to the spent fuel in the fuel pools.

I believe that this is a serious problem too, and I think that one should begin by asking just for the sake of understanding the problem what would the radiation levels be if there was absolutely no water in the spent fuel pools and how close could workers get? Does shielding exist that would allow workers to approach the spent fuel pool if it had no water in it?

And secondly, with regard to the possibility of zirconium fires in the spent fuel pool through extraordinary circumstances, as I understand it the heat generated by a zirconium fire, and I'm not just talking about the exothermic reaction but an actual fire, contributes heat that is comparable to the heat from light water reactor fuel freshly out of the reactor, so it really exacerbates the problem.

I'm just wondering why that hasn't been addressed in the task force report?

THE CHAIRMAN: Staff, short reply, please.

DR. RZENTKOWSKI: A very short reply. The different fuel bays accidents are analyzed and are part of the safety report for every operating NPP.

And it has been demonstrated it would take days to expose the top fuel in the bay, following a loss of cooling. It is incredible to assume that in the meantime the operators would not act to protect fuel and cover it.

Basically it requires at least seven days for the water to reach 100 degree C, and many more days for the fuel to be uncovered.

So this scenario is really non-credible because in the meantime there's many ways of providing the makeup water to the spent fuel pools.

THE CHAIRMAN: Okay.

DR. EDWARDS: Do you consider a sudden loss of pool water possible, like through a puncture?

DR. RZENTKOWSKI: It's double-walled pool which is in ground, so we cannot see how this puncture may eventually happen.

DR. EDWARDS: Okay.

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

DR. EDWARDS: Thank you.

THE CHAIRMAN: The next presentation, I think this is the last of all presentations is from Bruce Power. It's outlined in CMD 12M-23.4 and 23.4(a).

And I understand that Mr. Hawthorne will make the presentation. Please proceed.

12-M23.4 / 12-M23.4A
Oral presentation by
Bruce Power

MR. HAWTHORNE: Good afternoon, everyone. For the record I'm Duncan Hawthorne, President and the Chief Executive of Bruce Power.

I have the privilege of playing clean-up here, I'm the last presenter.

So I've listened with interest to many of the points that have been raised over the course of the day and I want to try and talk a kind of higher level, on some of the issues that in fact were dealt with by the last intervener.

Obviously we've talked today about the nuclear event in Japan and much of this information will be known, but I thought it might be helpful to get some characterization of some of the findings that we have had.

What I know is we have reviewed this, there's been a lot of conversations today about regulatory action in the wake of Fukushima, but of course a parallel track to that has been activities of WANO as we speak to our 444 operating plants throughout the world.

So some of my comments relate to that and indeed direct contact with TEPCO. I’ve been to their facility twice, I’ve met with their staff, and so what I’ll tell you is what we saw, what I actually heard and not hearsay or media coverage.

Firstly, one of the basic principles -- and, Mr. President, you and I have talked about this. A basic premise here for safe nuclear operation anywhere is strong and independent regulation matched with an active operator interaction with WANO. It’s those two things that guarantee safe operation.

We believe that to be true. I believe that the CNSC staff would concur with that.

When we look at the situation in Japan, we saw the regulatory authority being very diffused and a number of conditions that we would consider to be within operational purview in our plants required prefecture approval in Japan, which meant it was very difficult for them to take operational decisions in the heat of the event that they were pursuing because they needed permission from local authorities.

And if you remember one of the photographs you saw, imagine the difficulty being in the Fukushima control room and trying to contact the local prefecture for permission to vent the reactor, it was impossibility, and as a consequence of that the event accelerated in the site without any mitigation.

And so that’s one of the key points I wanted to raise.

The second thing, which I think we’ve talked a lot about today is probabilistic assessment and all of those tools that we have, but one of the things we haven’t talked about is the very significant difference between a Three Mile Island or a Chernobyl event which initiated an event and were exacerbated on the plant as a consequence of decisions taken or not taken by the plant operators.

Compare and contrast that with a plant that was operating normally and was subjected to a very significant external event and what the impact was and what would have been considered the operation of the plant.

And for our part, a number of key lessons learned, I've said many times, and on the record, that every event, whether it's in a nuclear industry, the airline industry, the petrochemical industry has lessons that we can learn as an industry, and they are not always highly technical lessons.

For example, site communications were lost. I had a conversation about dosimetry not being sufficient dosimetry. One of the major reasons there was not sufficient dosimetry in Fukushima was all the spare dosimetry was stored in a (inaudible) basement in a backup room. Guess how far under water that room was when a tsunami flooded the basement?

So it wasn't that they didn't have dosimetry, they didn't think strategically about where it could be placed in the event of a -- so these were not high tech, you know, Harvard smart solutions, these were low tech farmer smart solutions.

And so it's no surprise to me that when we look at the lessons that we are talking of implementing them, they are actually what we're referring to as farmer smart solutions. For example, insufficient site emergency equipment, no roads, facilities or help coming in the near term, confused authority about amounts of activities, who controls the plant, weak communication and particularly useful understandable information disseminated to the community. I think it's a very important issue here about how the local community were.

Let me tell you a story, if you don't mind, as a short aside. When I was in Japan last time I met with a number of displaced families from Fukushima. Let's remember, 20,000 people died in that tsunami. One of the people said something very profound to me. Those 20,000 people would be alive today if we had been able to get them inside this nuclear plant because it was the only thing left standing in the area.

It's a very profound statement when we talk about nuclear safety. The one safe haven in that community in the face of that tsunami was inside Fukushima nuclear plant. We shouldn't forget that.

One of the issues again which I think we are learning and have to deal with is a whole issue about public communication in the face of an event. It came up in terms of what should the exclusion zone be around the site. Is it based on science or emotion? We move from 20 kilometres to 80 kilometres.

It's a consequence of that decision in

itself, 25 elderly people in a nursing home died and they died because they were not fit to be transported and yet someone imposed an exclusion zone. Afterwards when it was reviewed by science the general position was there was no reason for those people to be moved.

So there is an issue about communication and inappropriate action, and so when we talk in a few moments about the interface between emergency plans, provincial and federal, it's where those interfaces occur. I believe there's room for improvement and we'll talk about that.

But also let's be clear, in the absence of information, people will fill that void with misinformation, and that happened a lot in the Fukushima situation.

One of the great lessons learned for the industry I believe is that we have to learn to communicate in an easily understandable force. And I have Commissioner McDill asking about, you know, a short timeline, what happens after two seconds, what happens -- these are simple questions. If we cannot answer these we should not be running nuclear plants because we don't operate without a social licence to operate and we were sadly lacking here.

I can tell you if you -- this is one of

these crazy worlds that I live in, but I was contacted from people who lived in Japan, in Tokyo particularly, who asked me to tell them what was happening at Fukushima because they could not understand what is a Becquerel, what's -- I don't know what 50,000 Becquerel's is but boy it sounds like a lot. How does that compare to a milliram and a rad and what does that mean; can I drink this milk or not; can I feed my kids this.

We need to fix this as an industry because the reality is that if the public do not understand what we do then they do not have confidence in what we do. And I think that's one of the major lessons we have, we have to articulate our business in a way that reassures, because, frankly, I've always said facts are our friend but we did not put facts out in a timely and understandable fashion.

And, frankly, when I look at the presentations today, we did a lot of that today, we did a lot of industry speak about probabilistic assessments and things and I don't think that that necessarily reassures the public.

So one of the things we as a group regulator and licensees together have to do is find a way to speak in a way that the general public can be reassured and understand.

So that’s one of my next slides where we talk about effective communication. I can tell you for my part, I held open houses in our community. I invited the local community. I explained what I knew about Fukushima and why our plants differed and tried to pervade some reassurance around that.

But of course the reason I draw this as circles is within your local community people are used to communicating on the industry. As that circle moves out there’s a less knowledgeable audience and so it’s important we recognize the audience with which we communicate, and that’s obviously particularly true in the face of stress.

So one of the important things to note is that the psychological impact will be at this Fukushima area and that entire region for a very long time after the nuclear event.

Thirdly, which is one of the key things again we talked about is the importance of alignment with government agencies. If I take the Bruce Power site as an example, we have a 400 person strong emergency response capability. It involves fire fighting, security, healthcare, emergency responders, all of those things because we’re a rural site and we have always worked on the basis that we have to support ourselves for a significant period of time because we're around three hours away from any help, be it Toronto, London or wherever else it could come.

And as a consequence of that, we have a pretty good plan which we rehearse regularly with our municipality. But provincial exercises are not something that happen with any real frequency, and when you expand that to include federal groups I think all of us recognize the importance of testing that because it's clear in the Fukushima event that those various jurisdictional responsibilities can create delay and misinformation.

For example, I can give you a great example, we as WANO sent emergency dosimetry, temporary power supplies and a range of things to Tokyo for dissemination to the plant and the government turned it back, not because they didn't need it but because the government said we want government aid we do not want industry to industry aid. It was a nonsense situation that occurred.

We had two of our chief executives from Russia, the easiest place to help them, who landed in Tokyo and offered to send resources and they were told no because it had to come from the Russian government.

It's those kind of interfaces that need to be better understood.

And so one of the things that we heard just moments ago from EMO, one of the things we've agreed to do is to undertake a real exercise, which we are calling the Huron Challenge, or EMO are calling Huron Challenge, where we will test Ontario's emergency response capability in the fall, and we will do that around not a nuclear based scenario, but a significant infrastructure challenge.

Because when you look at our situation you can consider ice storms to be a credible event which could still take out transmission lines and leave us isolated.

As was mentioned previously, we had a blackout the 14th of August 2003 which was initiated by transmission in the U.S. So we can foresee situations where the plant has to operate as an islanded facility.

And so the intention of the Huron challenge is not really to consider what the forcing function is but to demonstrate that the plant can support itself and that the emergency interfaces that occurred between our emergency plan and EMO and perhaps even into the United States can be properly tested.

So this will be the first live test we've had for a significant period, and as mentioned previously we have done desktop reviews, we have seen the opportunity for change, but later this year we will do a full test in support of the EMO's activity.

I put a slide there just to give an indication of what the impact is of Fukushima, it's more about understanding. The event was a very significant event and will continue to be for a very significant number of years to come in that region.

But in terms of the radiological impact it was not long-lasting and as impactful as people may have suggested.

The final piece I'll talk about really is about public outreach. I've mentioned before about communication. I think -- my personal view is that we talked a lot about what we need to do but we failed to recognize -- just -- the position we are in in Canada and in North America generally.

Much of the things that we, WANO have recommend the industry do following Fukushima were already in place here in North America.

Every plant in North America is reviewed every two years by WANO, there's an in-dept review.

The Fukushima facility, it was eight years since the last review. So internationally there have not been the same frequency of events.

Similarly this regulator has been requiring plants to continue to upgrade their safety case and make improvements to the plants over time. That is not the same case as existed in Fukushima.

So we should take some credit for the fact that if some people would assume that we don't have to an awful lot following Fukushima it's because we have been doing a lot for many years to improve our plants, by putting in seismic, fire protection, hot steam release. All of those are destinal diverse systems.

It was mentioned by the previous speaker, well it sounds like Point Lepreau is already ahead of it. Well, the reason they're ahead of it is because these were regulatory requirements, as part of the refurbishment and it's no surprise that we had actually been making our plants more robust and therefore the step change -- if I can call it that -- between pre and post-Fukushima is not major in-plant design; it's more about portable, mobile and back-up equipment.

Finally just to put some context around this. We have polled the people of Ontario to get a sense of the support for nuclear following this.

I can tell you that all of the polling would suggest support for nuclear and support for nuclear refurbishment is back today where it was pre-Fukushima.

There is still a large degree of support for the technology and it's important that we understand that the public have not lost confidence in our industry.

Finally, as I say, we’ve heard this from many of the speakers so I don’t want to drag this out. We are -- the plants are already different today, we have more portable equipment in place. We recognize the importance of communication.

One of the things you’ve seen today -- you couldn’t fail to see -- is a strong integration between all the licensees. We’ve worked collaboratively together through the nuclear working group to provide mutual aid to each other.

So effectively we’ve said in the unlikely event that one plant is in distress the other utilities are ready, set up to provide mutual aid response to them.

I know that time is an issue so I don’t want to go any further than that but my important message to you is that there’s one thing that I’ve said to many people: “You cannot regulate your way to excellence” and we are striving for excellence in this area.

There are two building blocks, we need strong regulation but we also need an eye on excellence and the eye on excellence comes from WANO, from operators working together to improve each other’s performance.

And it’s a combination of those two things which I believe gives us the safety standards we enjoy here in Canada.

Thank you.

THE CHAIRMAN: Thank you.

Okay, Mr. Tolgyesi?

MEMBER TOLGYESI: Merci.

You were mentioning that Japan government declined Canadian and Russian industry help. Do you consider that it was due to potential negative public perception or what was this reason?

MR. HAWTHORNE: I think the answer to that is really it’s a cultural one. One of the things that I think is fair to say here is that when you get into a situation like this governments will take control of the event, and governments typically talk to governments.

I can tell you for example, I know there’s people from Canada Health here and we talk to NRCan, we offered help through NRCan because we knew that was a way to offer our help and support.

It was mentioned previously NRCan were already ahead of that because they had provided dosimetry, both to their own staff and the embassy and made available to the health workers.

But typically I think it’s because I’m a government person, I’m used to talking to the foreign office and not, you know, OPG, Bruce Power. That’s not what we do. And it was very difficult for us to get directly to TEPCO.

Just to complete the answer; WANO has an office -- one of our regional centres is in Tokyo, so in the face of the event our outer regional centres call there and say “What do you need” and they say “Could you send us those things” and that was how it came about.

But of course when the event occurred TEPCO will then -- you know, isolated within their own site and couldn’t receive that aid.

Just a point but that’s one of the lessons you learn.

MEMBER TOLGYESI: Was it -- what you’re saying, that you saw this relation also with the -- with industry, like, typical or they expected that you go through the government or it was easy to come to them and offer them help and how they will react?

MR. HAWTHORNE: Yeah, let me give you an example; we mentioned the fact that the BWR plant design is a Mark I BWR design -- GE design. Well, there are six of those in operation in the United States, so as part of our Atlanta centre, WANO group, we get together experts from those sister plants and we say were we going through the event how would we deal with it.

We put those people in contact with TEPCO design engineers. And in fact if you went to TEPCO’s office right now you would find 14 people from across the world in their office helping them with instant manage.

The design now of the secondary containment has actually been done through a series of collaboration from international people.

So that relationship is there now. It's more after the immediate crisis management there's a greater relaxation of that but in the early crisis management piece, control was kind of wrested TEPCO and became a federal matter.

MEMBER TOLGYESI: The last one; do you -- have you -- you think it could be overcome, you know, if a similar situation is happening?

MR. HAWTHORNE: Let me give you a short answer because this is a preview into some of the issues, and Dr. Binder and I have talked about this before.

I think -- I've been to some of the regulatory sessions that have been held since the event and I referred to it as the mirror and the window scenario.

When you have a problem -- if you read any of Tom Peters books, you talk about when you want to congratulate someone you look in a mirror and when you want apportion blame you look out the window.

The reality is when you look at the

situation in Japan the session I went to in Paris implied all the regulator had to do was tell the operator to do things.

And that was a great travesty in my mind. Because lots of regulators, including CNSC, were aware that the Japanese regulator was not performing at the same level as CNSC do.

And so one of the important things that regulators could have done is insist on a regulatory standard that would be uniform, because that would have gone some significant way to mitigating the possibility of this event.

Because we've heard already -- someone talked about -- I'm trying to think of the term -- as institutional failure or organizational failure, but one of the markers in that is about what is the international regulatory standard and how do we the international regulatory community ensure that all regulators meet that.

I think the operators have an equal obligation to ensure that all operators throughout the world operate at a higher standard.

And WANO, recently, when we had our meeting in China, we agreed we are going to impose much higher standards on the rest of the operators; harder to do because it's a voluntary organization, much stronger if the regulators impose high regulatory standards.

MEMBER HARVEY: What is your agenda? Let's speak for Bruce now. When do you think you will have a great plan to the level that will satisfy the plan?

MR. HAWTHORNE: So as we mentioned previously there's a number of things that were done in pretty short order. Very shortly after the event we recognized the organizational effect in this piece of this, and we do organize the same management team under one instant controller.

So that rather than have security and fire and different parts of the organization we brought them under one instant control, because that was a way of making sure that let us get connectivity around that.

Lastly, the other things that we do are related to additional equipment. I went to the board immediately, got financial sanction to procure a significant amount of additional portable equipment. All of that's in order and all of it will be in place very shortly.

We already had severe accident management guidelines in place for Bruce A, because it was a condition of restart. Back to my earlier point, one of the things that we did as part of restart was to prepare severe accident management guidelines because it was a condition on restart. We now have those in place for Bruce B also.

So we have now emergency procedures in place, we have an emergency organization restructured, we have severe accident management guidelines.

The next change, if you like, would be the arrival of additional mobile equipment. And the fifth part of that story is a full rehearsal of the emergency measure Ontario plan for Ontario. So all of those things are in place now.

There are a few design improvements we'd like to make when we have the station containment outage, and if you remember we asked to have the station containment outage delayed until I was to go in and make modifications which effect the multi-unit aspect of our plan. But a lot of these things have been done already.

Sorry, one thing I omitted to mention. I do agree with the speakers that talk about culture, we've talked often about culture here. I can tell you that I've been in the industry 40 years, hard to believe when I look so young, but the important thing is that after the Chernobyl event I was asked to do, and for the UK, a human factor's assessment to look at all the plants to identify whether it was possible for people to undermine either in a malicious way, or in a poorly planned experiment the safety systems on our plants.

So one of the things I think is missing from this report is I reckon this in all plants in the world post Chernobyl were asked to do that human factor's assessment. And so we in history have improved our plants around that.

And the second thing is because of my kind of career the IEA produced a document called NSAG-4, which was called safety culture and it came after the Chernobyl event.

That safety culture document has been a guideline for this industry for 20 years, and the CNSC have always looked at safety culture on a site.

And WANO has also looked to that because we believe you ensure safety by robustness of design, strong regulation and good operation. And good operation includes a culture of safety that exists within a site.

So that is an active part of all of our, what programs.

THE CHAIRMAN: Merci. Dr. McDill?

MEMBER McDILL: Thank you.

With respect to public communications during the event, on the Canadian television systems at the very least there were two people that appeared consistently; interestingly enough the previous intervener and yourself.

MR. HAWTHORNE: Fact and fiction you mean?

MEMBER McDILL: No comment. But I think and this is to go to CNSC, I think that one of the things that was missing at least from my perspective, I mean, I was kept in touch, I knew what was going on.

We were getting regular updates, I knew the 24/7 centre was working, I knew that was happening. But there was nobody from CNSC. And I know that in some of the other countries a regulator or a representative of a regulator, or a representative of the national government came on and said something.

So I wanted Staff to comment on that and I also wanted industry to comment on that. I'll start with Staff.

MR. JAMMAL: Do you mind if you start with the industry to put our thoughts together?

MEMBER McDILL: I'll start with the industry then, yes, please.

MR. HAWTHORNE: Yeah. I think there's probably two reasons for that. One was that as a chair of the WANO Atlanta Centre I was in position to get timely information from the Fukushima plant. So if you're like privileged enough to get real-time information, so that gave some of my information more credibility.

But the second thing I think was a concern that what was actually happening was being misrepresented.

And we're a private sector company, it matters to me, you know, just how people view the industry. So I think the reason that we saw commentary was; 1) because people knew that I was in an international position; and 2) because I was concerned to have accurate information out in the public domain.

MEMBER McDILL: Staff has appeared.

MR. JAMMAL: For the record it's Ramzi Jammal.

First you're correct we updated the website, we put the 24/7 in place.

The wide regulators wasn't out, we were trying to put in place several things, the messaging to the public and the interviews. I don't think we were asked for interviews, I need to recall from memory perspective, but we were putting out press releases to the media to pick up, and then I will ask Mr. Jason Cameron to elaborate a bit more specifically on this.

MR. CAMERON: For the record Jason Cameron.

I can offer a few observations just to add to what Mr. Jammal said. In fact the person sitting behind me Mr. Frappier, did in fact appear on national television. So the CNSC did at least in one instance have someone who -- sorry twice, on national television. So we did have CNSC representatives there as well.

Health Canada who's sitting behind me also had Dr. Gulley, I believe as the Government of Canada's representative. So there was a voice. The issue is is was it there often enough, and that's a lesson being learned.

One other thing, there is a major -- two major events that are coming up in the near term as well. One is an OECD hosted public communications workshop that is taking place next week.

CNSC amongst national regulators from around the world are gathering in Europe to review lessons learned on public communications and crisis communications. And there's also a major gathering at the International Atomic Energy Agency in June where the CNSC will also be well represented along with other Government representatives.

THE CHAIRMAN: Let me just remind you guys what happened the first five days. Everybody, and I'm not trying to revise history here, but the first five days nobody knew, there was no information, we didn't know the facts. And quite honestly we were not, even the CNSC did not have the plain language that Mr. Hawthorne is talking about, and it was a frenzy of misinformation that was going on continuously. And anything we would have said at that time would sound defensive, et cetera.

So what we're looking for is to actually pre-plan some things that could have said in case of catastrophic event. The disappointment was that IEA didn't have a communication savvy person that could deal with the CNN of this world.

And if you recall that we didn't hear from the DGIEA for I think at least three or four days until they were trying to get, again, I don't remember the exact date here, the first few days was not a moment of excellence for our industry, let me put it that way, where everybody who could spell nuclear was being interviewed and filling up with all kinds of misinformation.

So that's the lesson at least I took away that we got a lot to do in communication, just to explain the physics in layman, and the risks in layman language.

You want to say something?

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

That's why with the action with respect to enhancement of the communication to include what you call now the -- creating several things. One of them is the risk communication and put them in place so that we're disseminating the information.

But the key elements, as you mentioned Mr. President is to cant information that can be sent out in a public terms that the public will understand what it means.

THE CHAIRMAN: Dr. McDill, you?

MEMBER McDILL: It was something raised by the external advisory committee, as well, which is part of the reason I brought it up. I do know that some other countries put people out, communicators out to talk to the public.

Typically it was, you know, 30 minutes at dinner time call me and then chat kind of a thing, but that was one that I was aware of. But this is something I found lacking. I felt informed, which is good and I'm sure my colleagues felt informed.

I certainly got asked for interviews, which of course we don't do, so they came back up here and then they went out so…

THE CHAIRMAN: I didn't get too many phone calls on the first few days. And after that we put in a whole new production for trying to take the Fukushima information, try to explain it in layman language and post it, and we looked to become the vehicle for all departments. Whatever information was available we were posting. And for a while there it was the place where people went to get some updates.

But what we're trying to do now is -- we haven't talked about this -- we're trying to even develop what is known as a black site, something that we are preparing for in case of a disaster and what is the kind of information we will need, in layman language, can we drink this milk; you know, what does it mean when traces are being detected; you know, how big are the traces, and you know, what's the risk to health.

So we're trying to do some of those things and prearrange those data.

You know, there's all kinds of technical data on our website, Health Canada website, CFIA website, it's just that it's not put together in a way that the large population can digest and get some right to the fingertip so what does it mean to me.

MR. HAWTHORNE: If I can just say in response to that, one of the things which I think we missed here was the fact that if you were looking at a Fukushima event from Canada the greatest concern was western Canada, you know, where people were popping potassium iodine tablets and they're running out at stores.

And so, you know, I'm sure if Canada would comment that when we started talking about detecting things above background, we saw that as being, you know, well what is background and is background okay. You know, people were asking.

I can tell you, the most interviews I did on this event were in California on a call-in radio show because they bought up every potassium iodine tablet there was to be had. People made a fortune selling them because some of the misinformation suggested that this plume was heading their way and they needed to take potassium iodine tablets.

And, of course, as was mentioned previously, we do have monitoring in those areas but how we communicated, what that monitoring was telling us, you know, I'm not sure it gave confidence. As soon as we say we're detecting above background some people say well that's a good reason to be taking these tablets, which wasn't in fact the case.

That's some of the lessons we need to learn about. We think we are communicating in a reassuring manner and people see those comments as a reason to act in some way that we never intended.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: Mr. Chairman, I guess it begs the question, communication's a two-way street, did anybody at CNSC approach the news media to see what information they needed?

MR. CAMERON: Yes, the CNSC was in contact with media, with the reporters in the initial days and weeks after the accident trying to provide, particularly written information, not necessarily interviews per se, but to try to provide background information and/or to direct them to the relevant aspects of our website to keep them informed.

The other thing was to make sure that they were -- we mentioned that there was a deliberate effort to keep our website up to date. When that website was updated sometimes three or four or five times a day there were automatic push-outs to subscribers and to make sure that any journalists that were requiring information were also a subscriber to our website and would receive the information automatically through the pushes of our website. So we did try to keep them informed that way.

THE CHAIRMAN: Okay, can you just -- just so everybody knows, right now any notice that comes from CNSC get pushed to 1,600 ---

MR. CAMERON: Sixteen hundred (1,600) subscribers. The list right now is approximately 1,600 subscribers.

When our website is updated we'll receive an automatic push-out. On that list is about 80 to 100 journalists media across the country and internationally. They will receive that information automatically now.

MEMBER BARRIAULT: For myself, it begs, I guess, the question why did we get so much misinformation in the first few days? I don't know why. I'm a bit like Dr. McDill really and found that I was hearing all kinds -- where is this coming from and so I just don't know what happened.

MR. HAWTHORNE: Can I just ---

MEMBER BARRIAULT: Go ahead.

MR. HAWTHORNE: --- answer that the best I can?

Do you think the media wanted us to say it's okay?

MEMBER BARRIAULT: No, I was ---

MR. HAWTHORNE: I can tell you my specific examples. I was on an interview with MSNBC, they brought an oncologist from Florida on, the oncologist right out of the gate said, "I have no idea what's happening in Fukushima I'm an oncologist".

Despite the fact that he started by saying, "I have no idea what's happened in Fukushima" someone said to him, "What would happen if we were to release large volumes of caesium in the community, what would it mean, would it result in fatalities".

He continued to say, “I have no idea what’s happened here. I don’t know much about nuclear power plants but I can tell you if you released X amount of caesium you could expect to have 20,000 fatalities”.

Even before I spoke, the ticker along the bottom of it said, “Nuclear expert projects 20,000” because that’s what media wanted to do.

And the reason I still, to this day, have 250 people on a Facebook page in Tokyo is because they still worry about what is this information really all about, who can we trust.

And the problem is the media have continued to look at the doomsday scenario and it’s very difficult to counter that. So there is, you know, a social accountability, if I can call it that, on a media to check the facts.

And I think what the CNSC have done makes it harder for misinformation to get there because timely, accurate information is there to counter it.

But they will always find a Gordon Edwards or someone else who will say, you know, this is going to be 100 times worse than Chernobyl, and that’s a headline.

THE CHAIRMAN: And we’ve got to -- you know, we cannot wish for this to go away. In fact, it’s going to continue. It’s going to be 24/7 and we’ve got to learn to live with this 24/7 media that require to fill in, you know, the gap here, and they're going to fill it up either with right information, misinformation, whatever works.

MR. JAMMAL: Mr. President, I do not want to sound defensive -- it's Ramzi Jammal for the record -- but our website -- and you're making very good points, it's the communication at multi-level and different medium and media should be used.

The CNSC website, as a matter of fact, was getting over 30,000 hits. In addition to those hits, we were getting more than between -- I'm going by memory here. From Japan alone we were getting over 4,000 hits from the Japanese whoever we were tracking -- not tracking -- sorry -- we were able to identify.

So in addition to this media or this method of the vector that's being used then the interview should have been another factor.

I'll pass it on to Mr. Cameron for anything else.

MR. CAMERON: Jason Cameron, for the record.

I think that in addition to what Mr. Jammal said, and Dr. McDill, we heard the observation in terms of ensuring that there's a voice behind the information that is conveyed to the public.

A variety of technical lessons learned have been identified but we want to also assure the Commission that we are learning the communications lessons as well.

Particularly, we spoke of some of the advantages of our website and the communications that way, but we also learned -- we talked about the challenges of a 24/7 internet age nuclear crisis, but there were some advantages to social media. Some of us saw the power of social media in tracking down lost individuals in Japan. So there's actually a very powerful medium in order to get information out.

And at the time the CNSC was not overly adept at social media and it's only been recently, for example, that we've taken the initial steps into Facebook and learning the lessons in that regard.

So I just want to assure the Commission that we are learning the lessons on the communications side as well.

THE CHAIRMAN: Ms. Velshi?

MEMBER VELSHI: Mr. Hawthorne, given your unique perspective and what you've heard today, how complete do you think the CNSC's action plan is?

And I'm particularly interested in your thoughts on what we heard from a number of intervenors about institutional factor as being one of the root causes of catastrophes like this.

And you mention an international regulatory standard, for instance, is something that should be -- perhaps be entertained.

MR. HAWTHORNE: Yeah, I think there's probably two or three things that I would say in that regard.

Firstly -- and I don't say this because I'm in front of Commission. In other forums I would tell you that people have been very complimentary to Canada's response to this, the first thing.

The regulator acted promptly, the operators took it upon themselves. We wrote proactively -- Tom Mitchell and I signed a letter, sent it to -- before we received an instruction from you saying this is what we are doing.

So there was a very timely response from the operators, licensees, as there was a regulatory response frankly has been audited in an informal way, if I can call it that, because as was mentioned previously the stress test done through IEA came to broadly the same conclusions.

We haven't talked at all about the tests done in the Chinese plants which also includes a Candu, which also suggested similar conclusions in terms of the safety of our plants.

So here's three different regiments looking with slightly different optics but coming to the same conclusions, so that gives you some confidence on the robustness of the plan.

Secondly, the EAC approach is something that others didn't do. That's okay, I think I have this but I'd like someone else to look also. Again, a pretty comprehensive view of things.

And the fact is that when we, WANO went out to every operator, every operator responds and there is not a single operator in the world that says they don't have to do something, because in my world of complacency is the enemy of excellence. If someone had come back and said, we're good to go we don't living to see a Japan or a ring of fire we don't have to change anything, that would have been a massive safety culture feedback.

The fact that everyone said there is something we can learn from this and something we can change I think should give us all confidence.

And the final point I'll said is one I said earlier, we in Canada have a different regulator regime from the U.S., and different from the United Kingdom, lots of other places.

Our regulatory approach is one of continuous improvement. You ask a rule base situation, you pass you fail. There's much more challenge and innovation in the regulatory regime that we have, because it encourages us through dialogue to seek improvements; that serves us well, it has for years.

We might come in front of this Commission and argue about how quickly we have to do things, but we seldom come here and say we don't see the need to do things, which is a very important attribute of the Canadian regulatory system and one that we haven't taken credit for.

This report isn't about assigning credit it's about you're taking actions. But at least the Commission should be aware that we should take some confidence from the type of regulatory system that Canada has, because it put us in a position to have the safety regulatory we have, you don't get it by accident you get it by conscience intent.

THE CHAIRMAN: It almost sounded like a compliment to the Commission. We'll take it. Anybody else?

Well, thank you very much. We have one more intervention which is a written intervention. Okay, go ahead Mark.

M. LEBLANC: Le prochain mémoire est un mémoire par écrit seulement. Il est de l'Agence de la santé et des services sociaux de la Mauricie et du Centre-du-Québec. Le document est sous le numéro 12-M23.9.

Est-ce que les commissaires ont des questions au sujet de ce mémoire?

12-M23.9

Mémoire de

l'Agence de la santé et

des services sociaux de

la Mauricie et du

Centre-du-Québec

LE PRÉSIDENT: Alors c'est le même commentaire qui était envoyé par la deuxième ronde ou la troisième ronde, n'est-ce pas? Deuxième ronde?

So now I know that it's late, but I promised a round 2, 3 and 4, so feel free anybody has a particular question that they want to ask, now's the time.

Go ahead.

MEMBER VELSHI: You're not going to make any friends by asking questions but -- so I have a couple. One is around your recommendation on the frequency of coming back to the Commission on the action plan and you've recommended annual.

And as we look at the action plan and look at the 33 or whatever number of actions, the bulk of them are getting done either by the end of this year or by the end of next year. So I'm just sort of questioning is waiting for one year appropriate, and would it not make more sense that you come back perhaps the beginning of next year and give us an update?

MR. JAMMAL: Thank you for your question. It's Ramzi Jammal for the record.

There are a couple of things we would like to highlight, is even though we are recommending at minimum once a year and we're trying to coordinate through -- trying to get an efficiency for the use of the Commission time through the annual report.

However the tracking of those action items is continuous and we are actually putting in place a six-month review, I won't call it closure or such, but a review with respect to how we are progressing on a bi-annual basis.

We will take your comment definitely into consideration and we'll determine do we provide you with a written report? The reason we've said annual, to give you the Commission the opportunity to ask the questions, as integral part of the performance of the reactors.

So as we heard Mr. Hawthorne today talking about the exceptions of the action plan so then we can, I mean, use Bruce Power as an example, We can focus on the site- specific, the unit-specific improvement that was taken, I will give you that report from that perspective.

DR. RZENTKOWSKI: I would like to add a little bit to this response. I hope the Commission understands that all those actions are really forming a part of our compliance program. They have nothing to do with the licensing of the plants.

So that's why we recommended maybe once per year as an update to the Commission just to keep the Commission informed. Those, however, the outstanding items at one point in time will be linked to licensing, once one of the utilities will come in front of the Commission for re-licensing, so this will increase the periodicity.

THE CHAIRMAN: Well, can I, just for clarification. First of all we heard that many of the action items are plans. Okay, plan not implementation.

And for me alone I would project that every time a licensee appears in front of us we're going to ask, so what's new on the post Fukushima thing, just to get an update. So I suspect there'll be multiple times when we hear updates depending on what's in front of us. Did I get it right?

MR. JAMMAL: You got it right and it's Ramzi Jammal for the record.

A couple things, is what is closed will be closed as such and what's been transferred to a plan is going to be informing the Commission. The end point is going to be closure for those action items and the mentioning the report would be indicating such things.

In addition to when we come to the licensing to add to Dr. Rzentkowski's comment, is now every CMD will have a Fukushima action plan implementation from that perspective.

So we're going to try it out. This is the take-off action plan for this and at minimum now we're committing to come back to you on a yearly basis so that we're putting closure and giving you an update on how things are being done.

If there's a plan then we're going to elaborate on this plan to say here's the plan and the closure of that plan.

THE CHAIRMAN: Okay. So I've just been informed very interesting that the MPP reports are due in August, guess what? That's your first annual report, I assume, or at least an update, because you wouldn't be able to come to us without an update as to what's going on on our plan; is that right?

MR. JAMMAL: This action has been written already.

THE CHAIRMAN: Okay. Ms. Velshi?

MEMBER VELSHI: So the other one is on the plan, and the couple of recommendations from the external advisory committee the one dealing with communication and public education, and the one the non-MPP, which you've kind of reported separately and they don't form, they don't fit in with your 13 actions or that framework.

I know speaking for myself I think it would be nice if it was all integrated, and particularly the communication one because you've seen how much interest and desire there is that we make big strides in this area. So tell me why it cannot be incorporated in the overall action plan?

MR. JAMMAL: Ramzi Jammal for the record. You're asking two questions I'll start first with the communication recommendation from the external advisory committee report.

To be fair to the Commission and to staff too, we got the report on April 12th, so even though that's not an excuse, however we need to put in place as part of the action plan developed, what needs to be done because the AC has given us "high level guidance."

have interpretation devices please claim back your identification cards at the reception area.

Thank you.

--- Upon adjourning at 7:28 p.m./

L’audience est ajournée à 19h28