

Canadian Nuclear
Safety Commission

Commission canadienne de
sûreté nucléaire

Public hearing

Audience publique

February 5th, 2015

Le 5 février 2015

Public Hearing Room
14th floor
280 Slater Street
Ottawa, Ontario

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

Commission Members present

Commissaires présents

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

M. Michael Binder
M. Dan Tolgyesi
M. Sandy McEwan
M^{me} Rumina Velshi
M. André Harvey
M. Ronald Barriault
M^{me} Moyra McDill

Secretary:

Secrétaire:

Mr. Marc Leblanc

M. Marc Leblanc

General Counsel:

Avocate générale :

Ms Lisa Thiele

M^e Lisa Thiele

TABLE OF CONTENTS

	PAGE
Opening Remarks	1
CMD 15-H1.A Adoption of agenda	3
CMD 15-H2.1/15-H2.1A Oral presentation by Bruce Power Inc.	7
CMD 15-H2/15-H2A Oral presentation by CNSC staff	50

Ottawa, Ontario

--- Upon commencing on Thursday, February 5, 2015
at 9:03 a.m. / L'audience débute le jeudi
5 février 2015 à 09 h 03

Opening Remarks

M. LEBLANC : Bonjour, Mesdames et Messieurs. Bienvenue à cette audience publique de la Commission canadienne de sûreté nucléaire.

During today's business we have simultaneous translation.

Des appareils de traduction sont disponibles à la réception.

La version française est au poste 2 and the English version is on channel 1.

Please keep the pace of your speech relatively slow so that the interpreters have a chance to keep up.

L'audience est enregistrée et transcrite textuellement; les transcriptions se font dans l'une ou l'autre des langues officielles compte tenu de la langue utilisée par le participant à l'audience publique.

I would also like to note that this proceeding is being video webcast and that the proceeding

is also archived on our website for a three-month period after the closure of the hearing.

Les transcriptions seront disponibles sur le site Web de la Commission dès la semaine prochaine.

To make the transcripts as meaningful as possible, we would ask everyone to identify themselves before speaking.

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

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

Mr. President.

THE PRESIDENT: Thank you, Marc.

Good morning and welcome to the public hearing of the Canadian Nuclear Safety Commission.

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

Je souhaite la bienvenue aux gens ici présents and welcome to all of you joining us via the webcast.

I would like to start by introducing the Members of the Commission that are here with us today.

On my right are Dr. Moyra McDill and Mr.

Dan Tolgyesi.

To my left are -- you're tricking me
here --

--- Laughter

THE PRESIDENT: -- Dr. Sandy McEwan, Ms
Rumina Velshi, Mr. André Harvey and Dr. Ronald Barriault.

We've heard from our Secretary Marc
Leblanc.

We also have with us here today Ms Lisa
Thiele, Acting Senior General Counsel for the Commission.

CMD 15-H1.A

Adoption of agenda

THE PRESIDENT: I would like to start with
a call for the adoption of the agenda by the Commission
Members, as outlined in CMD 15-H1.A.

Do we have concurrence?

For the record, the agenda is adopted.

The hearing today is to consider the
application by Bruce Power for the renewal of the two
Nuclear Power Reactor Operating Licences for the Bruce A
and B Nuclear Generating Stations and consolidating as a
single operating licence.

Marc.

MR. LEBLANC: Thank you.

This is Part 1 of the public hearing. The Notice of Public Hearing 2015-H-01 was published on December 1st, 2014.

Submissions from Bruce Power and CNSC staff were due on January 5, 2015.

January 28, 2015 was the deadline for filing of supplementary information. I note that the presentations or slide decks have been filed by CNSC staff and Bruce Power within deadline.

Part 2 of the public hearing is scheduled for April 14, 15 and 16, 2015 and will be held at the Royal Canadian Legion in Kincardine, Ontario.

The public is invited to participate either by oral presentation or written submission at the Part 2 hearing. The deadline for the public to file a request to participate and a written submission is March 16, 2015.

In a notice published on December 19, 2013, the CNSC announced that it is allotting funds under its Participant Funding Program to help Aboriginal groups, members of the public and other stakeholders interested in reviewing and commenting on the licence application submitted by Bruce Power, to prepare for and participate in Hearing Part 2.

The Commission received several requests for funding. A Funding Review Committee, independent of the Commission as it is made up of external members not related to the CNSC, rendered its decision and provided funding to between 8 and 10 applicants. I think there are a few applications still being reviewed. The decision is available on the CNSC website.

In addition, I would like to mention that a submission from Greenpeace was received yesterday and has been accepted as an intervention for this hearing.

The Commission would like to remind potential participants in Commission hearings that sub-Rule 19(5) of the *CNSC Rules of Procedure* states that:

"Where a public hearing comprises two hearing days, any written submission and oral presentation of a person permitted to intervene at the public hearing shall be considered by the Commission on the second hearing day."

Nothing precludes the Commission from considering a submission from an intervener prior to Part 2 of the hearing and the Commission's process will be dictated by considerations of fairness.

As the submission has just been provided

to Bruce Power and CNSC staff, it would be unfair to expect them to address its content or respond on such short notice.

Should Bruce or CNSC staff wish to address the submission, they certainly can speak to it if they wish to do so.

As with all interventions, it is publicly available.

Mr. President.

THE PRESIDENT: Before we start with the presentations, I would like to acknowledge that we have some friends from other departments and other governments with us here today. So let me check to see who is here.

So we have representatives from Environment Canada. I understand that Ms Ali and Mr. Kim are here with us.

Okay. Good. They'll be available for questioning later on.

And we also have, I understand, online people from the Office of the Fire Marshal and Emergency Management, Mr. Kontra and Mr. Nodwell.

And we also have from Fisheries and Oceans --

Well, first of all, the Fire Marshal people, can you hear us?

MR. KONTRA: Good morning, Dr. Binder.

We're here.

THE PRESIDENT: Okay. Thank you.

And from Fisheries and Oceans, I understand we have Mr. Hoggarth, Ms Wright and Mr. Valere. Can you all hear us?

MS WRIGHT: Yes, we can.

THE PRESIDENT: Okay. Thank you.

CMD 15-H2.1/15-H2.1A

Oral presentation by Bruce Power Inc.

THE PRESIDENT: I would like to start the hearing by calling on the presentation from Bruce Power, as outlined in CMD 15-H2.1 and 15-H2.1A.

I understand that Mr. Hawthorne will make the presentation.

Welcome and the floor is yours.

MR. HAWTHORNE: Good morning, Mr. Chairman, Members of the Commission.

For the record, I'm Duncan Hawthorne, President and Chief Executive Officer of Bruce Power.

I have with me today a number of members of our executive team.

On my extreme right is Len Clewett, our

Chief Nuclear Officer; sitting next to him is Gary Newman, our Chief Engineer; and to my immediate right is Frank Saunders, our Vice-President of Regulatory Affairs.

So I'll be taking the Commission through some high-level things and Mr. Newman and Mr. Saunders will provide a bit more detail on some specific topics.

So let me start by saying I think we have a pretty positive story to tell of what's been happening on the Bruce site over the last five years. I know that the Commission have seen us before them on a number of occasions over that time but the company has transitioned quite significantly during that five-year licence period.

Over the last five years we've become an 8-unit site, returning all of our laid-up units to site and providing more than 30 percent of Ontario's electricity.

This of course played a significant role in the government's ability to phase out coal-fired generation, where 70 percent of that replacement power came from the increased output from the Bruce Nuclear units.

Of course, in doing that, we talked often about the attributes of an 8-unit site. We've created the world's largest nuclear operating facility and so it's important that we are better than the best in some specific elements of nuclear power operation because we do have all of these units in one place.

I think the report that's filed with the Commission shows that during that period of pretty rapid and significant project work we've continued to provide focus and operating the site to the highest standard.

I think there was a concern that very large project activity might distract our attention away from focusing on nuclear excellence in the operating area and I think all of the metrics that we've provided demonstrate that that wasn't the case, that we've been able to manage these large projects without losing focus on operational performance.

We've talked often over the period, in fact since we took over the site, about the demographic challenge on the site too. So I'll show you some numbers later which show that during that period of pretty rapid growth we also have transitioned the workforce in a very material way.

More than half of our workforce have actually joined us since Bruce Power came into existence over the last decade. So you can see that we have refreshed the demographic on the site and managed to do that in a way that hasn't created problems due to the loss of experience or expertise.

Again, I'm highlighting topics which I know we've talked about before here.

We've done a lot to reduce maintenance backlogs and improve the efficiency and the equipment reliability of the units, which of course are the key contributors to solid operational performance.

And of course one of the other areas that's fundamental to these very large projects is the radiological implications of dismantling reactor components in a high radiation background. So I'm particularly pleased that we've continued to keep not just our industrial safety record industry leading but we've also made significant progress in radiological controls and arrangements such that our dose reduction program has been very successful in a background of really high radiation workload.

Of course, one of the things that the Commission have been seized with is the industry's response to Fukushima and how we've adopted and introduced improvements and enhancements to our site. We're going to talk a bit about that because of course it's an area that's very important to the industry's reputation and I think we've done a very good job. I think Canada's done a very good job in creating a framework for meaningful response to Fukushima and of course our site has played its part.

And of course, one of the other things that's key here as the units get on in life is that we

continue to focus on lifecycle asset management and making sure that we continue to operate our plants to the highest standard.

So turning now to some of the more detailed elements, the next slide really just talks about what I mentioned earlier about our increasing role in the province and just demonstrates what we've actually done to help Ontario wean itself off of coal facilities.

And part of that thing for the Bruce site has also meant providing some degree of flexibility into the marketplace which was lost when coal plants were retired. We are providing that flexible generation but we're doing so by veering the steam demand to the turbine, not by manoeuvring the nuclear units. So for us, it's a conventional plant response as opposed to a nuclear reactor response to that.

So it's become an increasingly important role for these units in Ontario given that they play such a large part of the market supply mix. And so in periods of lower demand, then our units are capable of producing load and helping manage the Ontario network, a very critical feature of the market as it's configured today.

The next slide is really my attempt to summarize what we've been doing since we took over the Bruce site in 2001. Basically the business plan that we

had embarked on when taking over this site was that we wanted to, in a thoughtful, methodical way, seek to drive our performance to be industry-based.

And this matrix demonstrates that for a nuclear operator the best place to be is in the bottom right-hand quadrant. In that case, it's a plant that operates with very high reliability and obviously lower marginal cost.

I can tell you I've spent my career in this industry and I could plot every single nuclear plant in the world on this matrix and I could demonstrate to you, I think quite easily, that the plants that are in the bottom right-hand quadrant are also the safest plants.

If you look to the U.S. fleet, which I do often, you will see that there is not a single INPO 1 plant outside that quadrant. So it demonstrates that safety performance and the operational performance are very complementary.

And what I intended to show on the bullet points are the things that we have sought to do in order to drive our performance in that quadrant:

- of course, there's four safety pillars I'll talk about;
- returning obviously the four laid-up units to service;

- improving outage performance, because of course these units operate on a two-year outage cycle and so executing outages on plan, on budget, make a significant difference;

- and of course, if you invest in the equipment, you greatly reduce the forced loss rate on the units;

- and another feature which can affect forced loss rate is human performance error, and again, another area we've spent a lot of focus on;

- the equipment reliability initiative, you know, if you statistically look at plants there's a large body of evidence that shows an equipment reliability index that increases has a negative effect on a reduction on forced loss rate and of course we've seen it on the site.

So turning to the next slide here, really these are sort of motherhood statements for nuclear safety excellence. I think you'd see them and this Commission would be well aware of them.

Firstly, the tone at the top of an organization is particularly important when you're managing change and so we have always led with our safety value. We've demonstrated year over year a strong focus on industrial safety. We've done so by managing radiological

standards and driving those through.

These are about the behaviours of people day in and day out, and so it's very much a hearts-and-minds approach, that we have to demonstrate that when we say safety first is a value that we can demonstrate that in every decision we take. And that's why it's been so very important that in this high radiological environment we've spent millions to reduce the dose to employees and to drive the highest standards of radiological protection.

Number two, as I said, we are a high asset value business and the performance of our equipment has a direct effect on the bottom line and indeed on the safety performance, and so we've invested heavily in the assets. We've spent \$7 billion on these assets since 2001 when we took over the site and we continue to invest heavily in the units to improve the quality of equipment, to deal with obsolescence and to generally improve the reliability.

In addition, we've moved away from, in large measure, a corrective maintenance approach to a predictive maintenance and a preventive maintenance approach and focused a lot on human performance.

I tell people often I think we're in the people business as opposed to the nuclear business and my rationale for that is to say that we operate 6300

Megawatts. If that was a gas plant, I'd probably have 300 employees. It's a nuclear plant and we have 4,250 employees, which means we're in the people business, and so how we invest in our people is a fundamental feature of good nuclear operation.

And so when we talk about making a change in the business, this year we've returned four reactors to site but in reality our biggest success has been the engagement of employees and the engagement with our community around the site.

So I think that, you know, if you ask me what we are best at, it would be those two things: employee engagement on site and communication offsite. I think they continue to be our strongest cards.

When we talk about the safety initiative, the way we explain it onsite is really this diagram here which says where is our focus.

Equipment Reliability Index, as I said, is a basket of indicators that talk about our forced loss rate -- some of these indicators are reactive, most of them are proactive -- what is the backlog in each unit, how does that compare with industry-based as well as human performance errors.

As mentioned before, industrial safety has been -- and this Commission have seen it year on year with

your annual review that we continue to be industry leading on industrial safety. And we don't get there by accident. You're zero by choice, not by chance, and it's been our mantra since we took over this site.

And with that kind of safety value, it's then possible to deal with personal behaviours and radiological errors in reducing personal contamination events.

And of course the final plank in this is actually being a good steward of the environment. And again, with a large facility such as ours, it's increasingly important that we pay attention to environmental performance.

I want to turn to reactor safety.

As I mentioned previously, there has been an increasing requirement to produce more and more support documentation for the plant operation, which we have participated actively in.

The enhanced A and B safety reports.

The focusing on probabilistic safety analysis.

I think it's a very credible and worldly change in regulation, quite honestly, for me to see a more balanced view of risk and you're looking at new ways to assess risk. And of course we've extended that now in the

light of Fukushima and other industry experience to include external hazards such as fire, seismic, high winds, flooding. And of course for us, given the size of the site, it's important that our PSA does cover the whole site.

And of course, as this Commission is well aware, all of the licensees were required to do a very detailed review post-Fukushima and to identify things that could be done to enhance their facility's response to Fukushima-like events, if I can call it that, where the plant has to support itself without any external support mechanism.

And of course we have done our part by introducing a lot more mitigation equipment, temporary equipment. We've operationally tested that. If you remember, we've talked to this Commission before about the Huron Challenge where we ran an exercise involving all of the emergency organizations to confirm our ability to respond to those types of external events.

Turning now to radiation safety, as I mentioned earlier, the type of work we've been doing here, not just in terms of the restart project, which of course carried a significant radiological burden, we're also doing a lot of reactor inspection work which itself carries a high radiation dose. So we have been working very hard to

largely engage employees and explain how they can effect that by their own day to day operations by making sure they are trained and qualified before they get to the radiological workspace. They would have also done a significant amount to adjust the source term and in so doing reduce the exposure potential for employees.

We continue to see lots of opportunity to reduce that further by the use of new equipment and robotics, things that allow us to do things from a distance as opposed to having employees on a reactor face. Over the course of the last five years, we have spent \$250 million to procure and in some cases design new equipment that allows many of these reactor face activities to be done more efficiently, but also in a way that doesn't expose the employees to the same level of radiological background. It's a key part of what we have done on the site.

Industrial safety. As I mentioned previously, we have long seen this as an important benchmark of what we do and for many people who don't understand our industry and the inner workings of nuclear reactors, the one thing they do understand is that everyone goes home safe every day and that has continued to be something that we have cherished -- we continue to focus on.

And when you consider what the accident

frequency rate was like in 2001 when we took on the site versus what it has been over this last period, you can see that we have continually pushed very hard on this sort of level of performance and a great way of performing the industry benchmark. I see that as a journey. It's not a destination. It is something we have to continually focus on.

On the environmental safety front we of course, like many utilities, see the ISO 14,001 Standard as the standard for excellence. We have a number of major research projects on the shores of Lake Huron and, given some of the EA follow-up work we had previously, we continue to work in this area.

I think this is another one of these community outreach initiatives that we have had. It goes beyond just simple regulatory compliance. It goes to environmental excellence where we can. We sponsored a lot of activities in and around our site which are not really directly related to the site operation but are the right thing to do for the environment that surrounds us and we continue to partner with environmental groups to promote these standards and values.

We have had recently a lot of interaction with the Asthma Society and that has come very much on the heels of the closure of coal facilities. The Asthma

Society have very strong statistical data that shows the value to the health of Canadians associated with the removal of coal generation from service and of course we are very pleased to see that that has been attributed to the increased market share coming from nuclear and our site.

I have mentioned before the importance of equipment and reliable operations. Of course, for a business like ours there is also a bottom-line impact. With a unit with a high fixed cost operation, the one thing that we have to ensure we do is operate our units reliably and of course, as I mentioned earlier, that also is evidence in a higher safety standard. If the plant operates flawlessly then it also means it operates safely and over this past year Bruce B was recognized as operating at nuclear excellence. Forced loss rate on the unit is world leading and it's world leading not just from a CANDU point of view, it's world leading from any reactor design in any country anywhere.

If you turn to the next slide, Frank?

You can see that the forced loss rate in Bruce B is 0.6 percent, which is high top decile in the world. And Bruce B has actually been a consistent performer like that for the last three years at least, '12, '13 and '14 were of that order. As I mentioned earlier

that comes from investing in equipment. It comes from investing in people. It comes from employee engagement and it's just a continual drive towards the highest standards of operation.

Bruce A has a slightly different story to tell of course because over the last five years, and before that we were busily returning units to service. So 2014 was the first full year we had where all eight units on site were operating. And it's fair to say that in the beginning part, this time last year, Units 1 and 2 suffered, you know, quite a number of forced outages, many of those things related to legacy issues.

But in the period since the Bruce A units, and particularly 1 and 2 have run tremendously well and I actually say a new four unit running record for the site, a lifetime record. So it is demonstrating that the improvements we made to secure and improve the operation at B and Units 3 and 4 are now transitioning into Units 1 and 2. And so we had taken Unit 3 down very recently, by choice, and at that point the site was on a record run.

So we continue to be very pleased to see that those areas of focus do reflect themselves in the case performance of our units and we expect that to continue for the long term.

I did mention the staff situation. When

we took on the site in 2001 we took it on with 3,200 employees. Today we have 4,250 employees and you can see that all of those people we assumed in 2001, 1,700 of them have retired.

So we really have refreshed the workforce and you can see more than 1,000 more employees under the age of 36 than we had at the time of financial close. So we have refreshed the workforce. We have brought in a younger group of people and, you know, have obviously set the business up for a longer term and more secure future.

We have talked often in front of this Commission about staffing, and particularly in the area of licensed operators. We continue to drive for more operating licenses on the site. We have more than 180 certified operators in place and so over this license period 130 new certifications have been granted.

Continuous to that area, we are actively working to enhance because we see value in operationally qualified personnel being not just in the control room, but also in our outage organization and our work management organization and our engineering organization where their operational knowledge and experience can enhance the support from each of those functions. So we continue to see that as an area which offers opportunity to improve the site further, but we have moved beyond the situation where

we required everyone to be around every day in order to meet staffing requirements, so we are very pleased with the number of people that are getting through these very difficult and rigorous licensing challenges.

As we mentioned before, in the same way that industrial safety performance has improved greatly, so too is human performance. This is an area which the industry globally continues to focus on. Employees -- and it's a combination of two things, in my view. One is very experienced employees who actually take as routine matters that they should pay more attention to and inexperienced operators that perhaps don't understand the risk. Both of those things affect the industry globally so as a focus for World Association of Nuclear Operators.

And we on our site have spent a lot of time and energy to focus employees on human performance. We have invested heavily in tools and mock-ups and systems that are designed to make employees aware how easy it is to make human performance errors and to do that in a risk-free environment and a mock-up situation has actually led to a lot of good meaningful learning and a requisite reduction in human performance errors.

So again, it continues to be an area that we focus on. We are training contractors when they come on-site to carry out outage work to work at the same

standard, because obviously with a large site like ours we are dependent on contractors to support us during outage periods and so it is really important to us that their working behaviours, standards and values are consistent with our own staff.

I mentioned before the communication piece. I think as an organization we have never taken for granted our community. Of course, as the largest employer in the area there is an obvious financial implication for us being in the community, but that doesn't -- that doesn't give us the right to carry on our work without taking the value of communication forward.

So we have always been a very active communicator. We have done so by communicating in different ways and using all of the manners with which people today receive information. It is not a Globe and Mail, Toronto Star only these days. It's social media, it's Twitter, it's Facebook, it's community newsletters. We have a Bruce Power application which I would encourage all the Commission to download which explains not just what's happening on the Bruce site, but it also explains the Ontario energy market and tries to educate people about the supply mix and the province.

We tried last year a new mechanism which was a virtual town hall which I ran. We had 11,000

participants in it last year. This year, in fact just last week we did the same again and had 17,000 people dial in for an hour and a half. We took all questions from all comers, but it does indicate the level of interest. Now, fair to say a number of those people are wondering how they get a job at the Bruce site, which may be expected but, you know, there was a good far-ranging discussion about what our plans were for the site, some performance areas for the site and again one of these kind of outreach initiatives which you have to be thoughtful about. In the winter people don't want to come to a town hall. Actually, I might have had 100 people in the town hall at best versus 17,000 on the phone.

So these new, innovative ways of communicating with our community are really important for us and it is not tied to any regulatory hearings. It is not tied to any timing other than given our community and annual update from a chief executive on what we are doing on our site and support of other communications that they have heard of.

So if you turn to the next slide here, it just talks about how that represents itself when we do polling. Very important to us is to understand if our messages are being heard, if they are being understood and what that means to people's opinions. So for us you can

see there are pretty strong numbers in terms of people's confidence that we are operating to the highest safety standards, that we feel secure and that the management are operating the facility efficiently.

So these -- whenever I show these slides to politician I say, you know, you would go to the polls every day of the week with numbers like this. So it is important in our industry, we don't take it for granted, but it is important that we don't allow the small vocal minority to give the impression that they represent a larger constituency than they actually do because around our site we have very strong support and in Ontario generally the nuclear industry is enjoying the highest level of support than it ever has, even in a post-Fukushima world.

As I mentioned earlier, our community outreach program goes beyond just simply communicating. We have tried our very best to be a good corporate citizen around the site and take our social responsibility very seriously. We introduced last year for the first time in a very long time station tours. Obviously there are parts of the site that we don't take people to for obvious security reasons, but we always wanted to be as open as we could be with the community. Those site bus tours were always oversubscribed, so again it is an indication of interest.

We continue to run school programs and community events.

Again, one of the things that we have recognized is the important dialogue we have with the Aboriginal community around us. We have protocol agreements in place with all of our communities around, be it the Saugeen, Ojibway or the Métis and so we continue to do that. We were awarded the gold medal with the Canadian Council for Aboriginal Business. We are the only utility to have that award and, again, it is recognition that we are going above and beyond to engage the community

You know, if you ask me honestly, I am still disappointed we haven't been able to offer enough employment to the community around us. We are trying our best to do more. Qualifications and academic qualifications are problematic in that area, but I would still like to believe we can do some more in that area. Frankly, I wouldn't be satisfied until we do have more Aboriginal employees on our site, so it continues to be unfinished business as far as I am concerned.

I mentioned before the communications. We also -- if I go to the next slide, Frank -- because we are the largest employer in the area there are obvious things that we should be doing and supporting in the area through sponsorship. We give about \$2 million annually to various programs around us. Typically when we sponsor things in

our area it will be things that are consistent with the corporate values. We don't typically sponsor sports teams or things like that, although we do with First Nations communities.

We will typically support medical clinics, medical investments, physician recruitment, things that actually bring the sort of services to our rural community that our rural community requires and we have, as I said, made special efforts with the Aboriginal communities in terms of sport and development and mental health and things that we think are appropriate and that the community leaders would actually like our support. So again, a very important role for us and, again, of the things I am most proud of in Bruce Power is our relationship with the community.

And I mentioned before, when you look at another slide which is more about how our community views us, you can see that that feeling that we are a community-based company is strongly reflected and 90 percent view that we are involved in a positive way in this community. So, again, these are numbers which shouldn't be taken for granted, they are very strong and a good reputational benchmark, if you like, for the type of company we are.

I'm going to go to my last slide before I

hand over to Gary. Ongoing areas of focus for us, of course we know that the work that we are doing on our unit continues to carry with it, you know, a lot of reactor face work and so we want to continue to further enhance that radiation protection program.

We can still see opportunity to improve, as I mentioned earlier, with robotics and new tooling approaches. We are implementing the remaining post-Fukushima requirements here. I think your CMD highlights that almost all of the initiatives have been implemented except for those that required full station shutdown to implement, which will be happening shortly.

We have implemented a very extensive asset management program and this is about recognizing that it is important we manage the life of these units and where appropriate extend the life. With an eight-unit site I would tell this Commission honestly that when two units were laid up and six operational, then the two units that were laid up were very tempting when you needed spare parts. They were the equivalent of our Home Depot on site and so now that we have eight units in operation it is really important that we make sure we have an adequate spares inventory. So we have invested a lot to increase the strategic spares that we hold on our site to ensure that we have the necessary equipment to support the site.

And again recognizing eight units in one place in many ways as a business is good news, but as an operator it means that you are going to have four outages per year because of the two-year outage cycle, so in order to do that we have created a centralized outage model so that we can actually move our resources around in a way that doesn't distract the operational staff from the running units but still provides the right level of support during outage programs. So that new model is in place now.

And, as I mentioned earlier, the best type of maintenance you can ever do is the stuff that you do proactively. So we have continually pushed for condition-based maintenance and we can see that reflected in registry maintenance black logs and particularly corrective maintenance black logs.

So with that, Members of the Commission, I would like to hand over now to Gary Newman, our chief engineer who will perhaps expand a bit more on the equipment reliability.

Thank you.

MR. NEWMAN: Thank you, Duncan. Good morning. For the record, Gary Newman.

So as Duncan already touched on, a number of the key elements I'm going to expand a bit more on, one of the areas will be on lifecycle management. What we have

found over the last licensing period, and before that, is that where we have had our major components where we have traditionally used lifecycle protocols we have been able to manage those extremely well.

So what we have done over that period is expand them to other critical structures systems and components to leverage off the good practices. These are predicated after protocols that come out of EPRI and other international practices so we are quite pleased with these techniques and they bode well for the asset management piece that Duncan also touched on.

What this folds into is long-term planning. Where we have found that we have aligned not only the technical requirements and the associated timing, but marrying that with our business plan always yields the best outcome. So that is what we have been working on over this last period and certainly over the last two or three years with a focus again on the asset management piece, which is sort of a roll up of everything we are doing in lifecycle management, system health, component health, et cetera.

What this requires us to do of course is monitor the condition of the equipment and it evaluates how we maintain the equipment, when we replace it. Duncan touched upon strategic and critical spares. It tells us

what we need, where we need those, where to invest and it also rolls into the maintenance strategy, our preventative maintenance program, the predicted maintenance.

And everything that we can do further upstream to predict when equipment is under duress is always in our best interest. It also fits with the cost model Duncan talked about. It is much less expensive to predict. For example, if I see current requirements in a motor increasing, I can take that motor out of service and do work on it before it breaks down and bring other motors into service in the interim period. So it lends itself to continuous reliable performance.

Looking possibly at one of the areas of focus that we have had continuously is pressure tube health and we have spent 20 to 30 years not only doing extensive R&D, but doing inspection work on these. Every outage typically the critical path will involve inspection of a subset of the pressure tubes in the unit of interest. We leverage off the work that our counterparts are doing domestically and of course technologies that we bring to that program from an international source. When we look at the analysis work that we have done to date it does indicate that the pressure tubes are sound, they are fit for service and good to go for the next licensing period. We do, as I mentioned, a fair bit of inspection and in

fact, as already noted, we are just entering into the first inspection for Unit 1, the first planned inspection and we will be doing the normal selection of pressure tube inspections that would normally be done on the unit.

On the R&D front to what we have been looking at is hydrogen concentration and what we do is we take ex-service tubes. We dope them with higher concentrations than you would currently find in a reactor today. To date we have been able to do that up to just over 120 ppm. What that does is, hydrogen, we know along with temperature and so forth explains, you know, fracture toughness behaviour. That fracture toughness then gets rolled into our leak before break assessments, and this is a key part of our fitness for service suite of activities that we deploy to make sure everything is still good to go.

We have done so on the R&D front with our peers. OPG would be a primary source, but also with AECL, now CNL. This research has been critically important. It feeds the material performance that goes into our fitness for service requirements and that, coupled with the very sophisticated monitoring that we do coming out of our inspection programs and so forth, tells us everything we need to know about how best to operate and what the remaining life would be on these pressure tubes. We take, obviously, the hydrogen information that we gather from

in-service tubes as well as tubes that we removed for surveillance and we roll that into predictive models.

The current models indicate that we will be good to go for at least 247,000. There is probably another 10,000 or so hours on top of that for margin, but certainly 247,000 is a very viable target as it stands today. And as we speak we are actually doping pressure tubes at higher levels and we are building the technology necessary to go probably up to about 150-160 ppm. By the end of this year we expect to be there. That will probably take us to approximately EFPH values on the order of 300,000 from a testing perspective.

So the 247 is very similar to other precedents at Pickering, we believe are very consistent with the work that's been done there.

Duncan also touched on the condition monitoring pieces, a critically important part of the input, and largely that comes about by developing and deploying inspection equipment, rack and tooling.

We take, as I mentioned, scrape specimens from our pressure tubes. These are analyzed at CNL and, in turn, tell us exactly what the hydrogen isotope concentration is. And so we've developed a new tooling to do that and do it in a manner which minimizes dose uptake. That's critically important to

us because of the need to protect our staff.

What we've also done, traditionally we've talked about SLAR maintenance in the past where we've done that with traditional loose-fitting spaces. What we found too is that some of our tight-fitting units also need some of that maintenance work done, so we've developed a tool that will actually detect and move those springs and we're just working through the process of commissioning that tool as we speak. That will be deployed in the coming years on unit 8 and anywhere else that we feel it's necessary.

I already talked a little bit about the research program, but it has been an ongoing focus. It's an area of high priority in the company and we continue to support, not only the research that we need here and today, but also to support the capability maintenance associated with both facilities and expertise at some of our key laboratories. That is important to us from a long-term planning perspective.

So as I mentioned, we roll all this information into our fracture toughness estimates. That, in turn, gets included in our leak-before-break assessments and this forms a portion of our fitness for service work that I mentioned earlier.

In terms of ongoing work, we will be preparing the Bruce A periodic safety review in 2015 and then subsequently the Bruce B version of that. This protocol follows as we normally do guidance that's provided by CNSC regulations, so we adhere to that strictly, and we also look at IAEA and safety guidance. We look beyond that as well, but we want to make sure that we're informed and meeting all those requirements.

As we already touched on, we're going to continue on the asset management initiative. We've gotten good success out of that. As I mentioned, the more carefully and thoroughly we plan, the better the outcome. We don't want any surprises and that's why we spend a lot of effort doing that and we will continue to do so.

MR. SAUNDERS: So good morning. Frank Saunders for the record.

And I'll touch a little on Fukushima, obviously a significant event during this licence period so worth spending a little time talking about it.

And certainly since Fukushima, both regulators and industry operators worldwide have been spending time understanding what happened at Fukushima

and how we should respond to that.

It was, as we all know, a severe natural event that triggered the events at Fukushima. So we started really, and I think that we look at it from three points of view.

The first thing we did was try to assess the risk and understand what it looks like, and you'll see today on our website the probabilistic safety assessment that now factors in all the external events that are sort of plausible in our area of the world and the results that go with that.

So we first started by understanding thoroughly what could happen and what circumstances might be under.

We also then added essentially a whole new layer of protection to the site, so we now have through what we call the emergency mitigating equipment, in essence, emergency pumps and generators and other things added a whole new layer of defence that simply was not there before. So it's a different means and a different approach and the consequence of that is when we go back and look at the PSAs and you look at the level 1 PSAs prior to Fukushima and you look at them now, you'll see that there's significant safety value gain in the order of a factor of 10 as a

minimum, higher in many cases. And that's to be expected because essentially you've built another, say another layer of protection that wasn't there before.

We've been very successful at getting that installed, so emergency make-up to the steam generators, make-up to the fuel pools and that is all installed, the quick connects are there, they work and we've tested them, the equipment's all in place.

Storage facilities in place. We have run many drills and exercises including the large one in 2012 the Huron Challenge in order to kind of prove out the concept. That exercise also looked at communication with all the government and public agencies that are involved in the process. So it tested not only our response on-site, but a general response to a very large natural disaster and their ability to communicate with the outside world and deal with that.

We've completely redone our emergency management centre to support that, so we have communication vehicles now that don't require any hardware on the ground other than our facility. We can link by satellite either to the Internet or telephone or all those things, we can link by radio, we can link by normal process, so we don't need

cellphone towers or hard line wires or any of that stuff to work anymore.

And that I think is kind of one of the big lessons out of Fukushima is perhaps that local infrastructure might get destroyed and, therefore, how do you deal with it?

And we have showed that we can deploy, you know, these new equipments on-site in a very fast timeframe. In fact, our current sort of numbers for hooking up water to the station for the steam generators is 30 minutes. So we can do this very quickly.

So the third aspect is really around communications and I'll talk a little bit about various forms of communications. Off-site communications is obviously one of the most difficult, so we've worked at this. When we were having the discussions with the local community and the province, we did realize in reality nuclear emergencies really just don't happen very often, so there's a bit of a challenge in setting up these communications things simply for nuclear because you just never use them.

So what we agreed in the end was that sometimes natural disasters do happen, so why don't we set up emergency communications that supports the

community in all things and we'll use it for nuclear, if the event occurs.

So that's what we've done. And you see in the picture on the top right there, we're still working on this one. We expect to get this one done by the end of this year. This is a text broadcast. We worked with one of the local providers. We tested out the technology, it works. It's a very useful tool. It actually sends a text to everybody that's in a targeted area, you don't have to live there, you just have to be in the area when it happens when the text gets to you. The company can tell who received a text, who opened it and the person receiving the text can actually respond with an e-mail if they have questions or something to do.

So a useful tool and most everybody carries these these days, so very effective. The only issue with this one is, of course, you need your towers working in order to send a text. So we have an answer for that one which we'll talk about in a few minutes.

We did secure the first AM broadcasting, so the AM broadcasts are like the little radios you see along the side of the road that says tune in this number to get information. Well, we have

one of those too, so you can set that up, people can tune in and you can actually broadcast the information locally in AM if it's necessary. So that works. And TELUS was the group that we teamed with on the text communication, but other carriers are interested in that as well.

We certainly did a lot of work around fire detection, suppression and training. In fact, we've just completed a new fire training facility on-site that's a state-of-the-art facility which assimilates conditions inside the plant: turbine generators, cable trays, large pumps, transformers, and so 12 months a year now we'll be able to train our fire crews in all the kind of fire events that might occur in the plant.

And in reality, when you think of the hazards that arise in a nuclear plant, fire is really the one that's the kind of a common denominator. No matter what event you might have a fire is possible, and so you really need to train and understand your fire crews.

And we have -- about 10 percent of our staff are actually dedicated to emergency response on-site.

So another form of communication,

really here this is with government agencies, so this is a picture of our off-site radiation monitor's automatic system. Again, completely disconnected from the grid, they work and operate on solar power, they communicate either through solar or satellite, so they don't require any hard wires or hard lines to communicate. We have 10 portable ones that we can also display. There's 44 of the fixed ones in a 10-kilometre zone around our site. They upload every 15 minutes, they're working today. And these things upload to a server that's in Toronto and a back-up that's in Montreal and it's available to agencies like, you know, Emergency Management in Ontario and CNSC here in Ottawa and Health Canada. So that is linked to them directly, they don't require any actual data transmission from us, it's going straight from these monitors and it's quite useful. They're actually very, I guess very sensitive is the word I'm looking for.

And I have here a short little video for you, 30 seconds, which just kind of gives you a sense of how these things work.

--- Video presentation / Présentation vidéo

MR. SAUNDERS: So you see here the spike on the chart behind you that came out of the

bowl and it was kind of funny. One of the guys helping us film this thing had that bowl on his kitchen table at home and he wasn't so sure whether he should have or not, but...

--- Laughter/ Rires

MR. SAUNDERS: We told him it was okay actually, that was allowed.

So I have to just figure out how to work the system here. And so this is quite an evolution in the way we do off-site radiation monitoring because it not only tells you the individual sites, it plots the plumes for you, it will show you what the actual conditions on the ground are and you don't have to do anything to get that information except log into the website and bring it up.

And with 44 monitors, in fact, they're very sensitive. Every time a thunderstorm rolls through or whatever, the radon that washes out of the air and that changes the readings on these things. So we can see very well what's happening. They do the spectrum as you've seen there, so our health physics people can pull it up, look at the spectrum and actually see what isotopes are there, what the energy ranges are and what it looks like.

So a couple of bits here and I brought along a little show-and-tell here on this one. So you see on the right the card that we're going to use for KI pill distribution and we see this, again, really as primarily a communication tool that you need to use. We don't expect people are actually ever going to use these, but we're going to give it to them, we'll have to help them understand what they are and we want to make sure that they actually know where they are and they can find them.

This is the actual size of the card. It will have a hard plastic cover when it goes out to people. We just finished last week sorting the contract for the covers. So it's really intended that you can take this, hang it in your closet on a hanger or wherever you want, down the basement, somewhere you know where it is and it's visible, it's easy to see, it's got a hard cover on it to kind of reduce tampering, so you don't have to worry about small kids and so forth likely getting into these things.

And with the permission of the province and the local municipality, this is what we plan to distribute over the next couple of months. We're just really waiting on the manufacturer of these things now. And I think it's got clear, sort of big

instructions, easy to read. I was a test case. I'm kind of getting to the age where reading this small print is a bit of a challenge, so they kept bringing me these things and I kept not reading them, so we sent them back until we got to a size that kind of works for everybody I think.

There are more instructions in the package if you want the details. So when you open it it's in there, but you need your reading glasses for those ones.

So the other thing we did, I mentioned that we had an issue in terms of public alerting through the text messaging is very useful and probably will in the end be the most used approach, but you have the issue that it does require the tower.

So we have another device here which is called an FM Alert. This is the FM Alert radio here, it's a very simple little device, fits easy in your pocket, on the shelf at home, it's charged. It operates on its own frequency so it's not operating on the frequency that your radio here is, but the signal comes from the radio station, so all you need to do is have enough radio stations to ensure you've got coverage and this will alert.

And I brought in a little video. I

took a chance here that these things would work, so --
but I think (off mic)

--- Video presentation / Présentation vidéo

MR. SAUNDERS: So obviously that message would have considerable detail in it if you were sending it about what you wanted people to do or how you wanted them to contact and so forth. It's got quite a lot of piercing audible sound, so you will hear it if it's in your house and, you know, go and have a look.

We really treat it as a thing you can put on the shelf and forget about, because that's what people will do for the most part. You simply plug it in like your BlackBerry, it has a battery obviously, but if you want to last for years, you plug it in like your BlackBerry and leave it sitting in your desk drawer somewhere and you will hear that if it goes off and you will go have a look.

So these public alerting issues are really, of course, in the jurisdiction of the province and the municipality, so our role here is really to augment and support them so that they're tools they can use. And again, we're actually doing this as a general area tool, it's not going to be limited simply for radiation emergencies, but in reality it's a tool

that can be used for any emergency that's required.

And so with that, I'll hand it back to Duncan for some closing remarks.

MR. HAWTHORNE: Thanks, Frank.

So if I can just summarize. Obviously there's a lot of information provided in CMDs and it's always difficult to know just how much detail to give the Commission in these introductory comments, but we tried to cover things that we think are topical, important and just overview our performance.

I think we've demonstrated over the years our continual focus on ongoing improvement of the site, the operational standards on the site and I think that's reflected in the data that's included in the CMDs and I believe the staff CMD reflects that also.

If I can just make a final comment. I know there's been an ongoing interest in long-term view of the site. Some have stated the Ontario Government's long-term energy plan anticipates the 6,300 megawatts from the Bruce site for the long term. For that to occur, we would have to be refurbishing, you know, the six other units when it becomes necessary to do that.

We are currently in negotiations with

the government over what the contractual terms would be for that and, you know, obviously I'm very optimistic that we will reach a conclusion to those contractual negotiations.

But in terms of our licence application here, our licence application assumes that none of that work will occur in this current licensing period and to the extent that we would have to change that as a consequence of the agreements, then we understand, of course, that that would bring us back before the Commission.

But at this time our licence period does not contemplate the need to refurbish any units within this five-year period being sought.

And as I mentioned before, that's an ongoing negotiation that's been going on for 12 months already and it's probably got a few months left in it yet. But that does reinforce the Ontario Government's view of the role Ontario requires from the Bruce site going forward.

And as Frank mentioned, I consider the KI pills to be a challenging communication exercise with the community, and so we want to make sure we do that right. We have some advantages because it's a rural community and people generally know us, but I

still consider that to be a significant communication challenge to bring the nuclear power operation into everyone's home. And so we want to use all of the communication tools that we have at our disposal, we want to build a partnership with the municipalities in order to roll us out to the community in a way that's reassuring, because the intent of the initiative I think is to provide reassurance, not to cause concern.

And so I think we have to be very thoughtful in how we take that forward. And it's not just about the design of the package, although that's part of it, it's also about the explanation that goes with it. So I see that as being a really important focus for us over the next couple of months as we implement this requirement.

So with that said, obviously we look forward to answering any questions the Commission have and we particularly look forward to welcoming the Commission to Kincardine for the Day 2 hearings.

Thank you.

THE PRESIDENT: Thank you.

I'd like to move on to the presentation from CNSC staff at this time as outlined in CMD15-H2 and 15-H2.A.

I understand Mr. Jammal will make the

presentation.

Just go ahead.

CMD 15-H2/15-H2A

Oral presentation by CNSC staff

MR. JAMMAL: Ramzi Jammal for the record. Thank you, Mr. President.

I just wanted to, for the public, re-introduce Mr. Barclay Howden who is the Director General for the Directorate of Power Reactor Regulations and I would like to thank on the record, one more time, Dr. Rzentkowski who will be leaving us for a much challenged assignment on the global safety level where he will be addressing the enhancement of nuclear safety globally.

So I'll pass on the floor to Mr. Howden. Thank you.

MR. HOWDEN: Thank you. Good morning, Mr. President and Members of the Commission. My name is Barclay Howden and I'm the Director General of the Directorate of Power Reactor Regulation at the CNSC.

With me today is Mr. Ken Lafrenière, Director of the Bruce Regulatory Program Division, also regulatory and technical staff from the CNSC are

present and available to answer any questions the Commission may have.

This presentation provides information in relation to the renewal of the Bruce A and Bruce B power reactor operating licences.

As you can see from the outline, this presentation focuses on CNSC staff regulatory oversight and assessments of Bruce Power's performance, regulatory focus areas will also be discussed.

Bruce Power is located in the Municipality of Kincardine, in the County of Bruce, Ontario. The Bruce A and B stations are part of the Bruce Nuclear Power Development site on the shores of Lake Huron. Ontario Power Generation owns the Bruce A and B stations and Bruce Power has been operating these stations under a lease agreement with Ontario Power Generation since 2001.

The Bruce A station consists of four 750-megawatt CANDU reactors which came into service between 1977 and 1979. The Bruce B station consists of four 817-megawatt CANDU reactors which came into service between 1984 and 1987.

In 2012, Bruce Power returned units 1 and 2 of the Bruce A station to service after the

refurbishment. All eight units are currently operational.

The current Bruce A and B operating licences expire on May 31st, 2015. Bruce Power has requested a five-year licence to continue to operate Bruce A and B. If Bruce Power decides to refurbish any unit, Bruce Power must return to the Commission for approval to start such a project.

Licensing considerations were based on CNSC staff review of the two licence applications and the information submitted to support the applications. In addition, CNSC staff assessed Bruce Power's past performance with its compliance with the regulatory requirements of the 14 safety and control areas and other matters of regulatory interest.

I'll now pass the presentation over to Mr. Lafrenière who will discuss CNSC's regulatory oversight, Bruce Power's past performance and focus areas.

MR. LAFRENIÈRE: Thank you, Mr. Howden.

Mr. President, Members of the Commission, my name is Ken Lafrenière and I am the Bruce Regulatory Program Director.

The Commission granted Bruce Power its

first licence to operate to the Bruce A and B stations in 2001. This hearing represents the fifth licence renewal request to the Commission since that time.

After the Commission grants a licence, the role of CNSC staff is to provide regulatory oversight in order to ensure that Bruce Power is operating the nuclear power plant in a safe manner in compliance with the requirements of the *Nuclear Safety Control Act* and its regulations, as well as the Commission approved licence conditions.

To confirm this, Bruce Power, like all other nuclear power plant operators, this is achieved by CNSC staff performing ongoing compliance activities such as plant walk-downs, assessments of operating performance, event reviews, system inspections, reviews of Bruce Power's programs and procedures, reviews of information routinely submitted in support of the licensed activities, performances continuously assessed, and the results in hundreds of positive/negative findings annually.

CNSC staff ensure that Bruce Power staff are qualified to perform their work, that the plant equipment is maintained and updated, if necessary, to respond to lessons learned from operating experience.

CNSC staff track all identified non-compliances to resolution, risk-significant issues are brought in front of the Commission as per the event initial report process. As well, staff report annually to the Commission on Bruce Power's performance in the CNSC staff integrated safety assessment of Canadian Nuclear Power Plants report.

Historically, Bruce Power has been a safe well-performing site. However, for continuous enhancement of safety Bruce Power is also implementing many improvements to the satisfaction of CNSC staff, and these improvements will be discussed further in this presentation.

Bruce Power is responsible for ensuring safe operation of the station where CNSC staff independently verify Bruce Power's performance.

As shown in this table, compliance verification activities by CNSC staff inspectors during the current licensing period is comprised of numerous walkdowns, inspections, and document reviews.

These activities represent over 12,000 person days of effort by CNSC site staff. CNSC site inspectors carryout daily walk-downs, field inspections with specialist staff from Ottawa following the CNSC risk-informed baseline compliance

program.

CNSC staff also increased these activities for special projects. The increase in a number of inspections in 2011 and 2012 was due to the refurbishment activities at Units 1 and 2 at Bruce A. And as the Commission is aware, these units were returned to service late in 2012.

CNSC staff conclude that for the vast majority of these inspections there are no significant findings and Bruce Power continues to be in compliance with all regulatory requirements.

As required in the course of compliance activities, CNSC staff raise action items on Bruce Power to track resolution of issues. Bruce Power has responded to the satisfaction of CNSC staff for all issues raised.

CNSC staff also conduct routine surveillance and monitoring activities above and beyond the inspections and walkdowns that are performed to provide further verification that the plant is operating in accordance with regulator requirements.

CNSC site staff attend approximately 500 operational meetings a year: including Bruce Power's daily management and leadership meetings,

which are outage meetings that discuss plant status; quarterly update meetings; corrective action review board meetings; management review meetings, which are the review of the station condition records; and plant health meetings.

According to licence requirement, Bruce Power has developed a robust management system, which includes a problem identification and corrective action program. And input to the corrective action program is the station condition record which documents issues and problems so that appropriate corrective actions can be taken.

CNSC staff have access to these records and routinely review over 10,000 station condition records per year to ensure that Bruce Power is meeting this fundamental nuclear safety objective.

Bruce Power's management system also requires that all critical activities are logged in the station control room logs. This helps ensure that the plant status is known by operators at all times.

For the purposes of providing insight as to how the stations are operating and whether there are any major issues that require CNSC staff follow-up, staff perform daily reviews of station logs at both stations.

CNSC staff conclude that Bruce Power's operating personnel are well aware of the status of the plant and that the plant is operating safely.

Action items are part of our normal CNSC staff ongoing compliance process that CNSC staff use to track issues.

During the current licensing period CNSC staff have closed 137 action items. There are currently 51 open action items for Bruce A and B, none of which are safety significant nor present an impediment to relicensing.

CNSC staff also perform document reviews and send formal correspondence to Bruce Power on the results of these reviews. In addition, informal discussions and meetings are held on a daily basis between CNSC staff and Bruce Power.

CNSC staff deliver consistent regulatory oversight by following a graduated enforcement policy. This enforcement process includes recommendation action items and directives, licensing actions by the Commission such as hold points in the licence, administrative monetary penalties, orders under the *Nuclear Safety and Control Act*.

In all the above exchanges Bruce Power has been responsive to CNSC staff and no escalation of

enforcement was required during this licensing period.

This slide provides a summary of plant ratings for Bruce A and B over the current five-year licensing period for the 14 safety and control areas.

Overall, the safety and control area ratings have been satisfactory to fully satisfy apart from the below expectation for the rating of radiation protection performance at Bruce A during the Unit 1 refurbishment in 2010. This was due to an event involving the alpha radioisotope exposure to workers.

Although this event resulted in an unplanned exposure to workers and was subject to Bruce Power appearing in front of the Commission for multiple meetings, over 500 workers were monitored. And the maximum dose assigned to an individual from the event was 6.9 mSv, which is well below the regulatory dose limit.

Since that time, the radiation protection program enhancements have been implemented at Bruce Power, as well as at all other Canadian nuclear power plants.

CNSC staff are confident that these enhancements will prevent an event of this nature in the future. Bruce Power's performance in the radiation protection program has since been rated

satisfactory for the rest of the licensing period.

CNSC staff do not expect the satisfactory integrated plant rating to change for 2014.

Performance in all safety control areas has remained satisfactory during the current licensing period. No worker or member of the public received a dose in excess of the regulatory dose limits. And all radiological releases were well below regulatory limits. The environment was adequately protected.

Bruce Power's programs were implemented and maintained effectively in accordance with licence requirements. Operating performance has been satisfactory throughout the current licensing period. Bruce Power has established and implemented safety enhancement during the current licensing period.

For example, CNSC staff are satisfied with the progress made by Bruce Power in implementing the Fukushima action items.

In summary, Bruce Power has made adequate provisions for the protection of the environment, workers, and public.

The Bruce A and B generating stations

have a very good safety record. There are currently no safety concerns and no impediments to renew the operating licence for the Bruce A and B stations.

CNSC staff, however, have regulatory focus areas which stem from the Commission direction, from operating experience or from new research findings.

The four main focus areas for this licence renewal are emergency management, aging, probabilistic safety assessments and the environment, which includes such topics as Fukushima action items and pressure boundary integrity. These will be described in more detail in the following slides. Bruce Power is working in these areas for continuous safety improvement, which is an integral part of the CNSC regulatory framework.

Bruce Power's nuclear emergency management program at Bruce A and B was rated satisfactory through the current licensing period. New emergency mitigating equipment has been installed and facilities upgraded are being implemented to address lessons learned from the Fukushima nuclear accident.

When CNSC staff CMD 15-H2 was issued four Fukushima action items were still open. Since then, CNSC staff have received Bruce Power's Fukushima

update and have determined that three of the four Fukushima action items can be closed as Bruce Power has met the closure criteria.

As of today, therefore, only one of 36 Fukushima action items remains open for Bruce A and B, and this action item concerns the evaluating the means to prevent unfiltered releases.

I would point out that the original design of the Bruce containment contains a filtered air discharge system. This Fukushima action item would be an upgrade to that existing capacity.

This Fukushima action item is on track for completion by December 31, 2015 as per its original schedule since these changes required long-lead design times.

Bruce Power has submitted a plan and schedule for the design enhancement. Bruce Power proposed an alternate method for achieving filtered venting, and the plan and schedule are currently being evaluated for acceptance by CNSC staff.

Also part of the Fukushima response, Bruce Power has improved its emergency response organization to meet international best practices.

Bruce Power has also procured new emergency mitigating equipment such as portable

emergency power generators and emergency water pumpers. These pumpers are capable of providing water to the primary and secondary irradiated fuel bays and boilers.

Other modifications made in response to the Fukushima event include modifications to instrument air to lock open boiler safety relief valves, and installation of passive autocatalytic recombiners in all units.

Bruce Power also built a new state-of-the-art emergency management centre. The functionality of this new emergency management centre and emergency equipment was tested in October 2012 during a full-scale emergency exercise called Huron Challenge.

CNSC's role is to ensure that an accident never happens. The Bruce facility is licensed because the Commission considers it safe to operate.

However, in the extremely unlikely situation of an accident, in 2014 CNSC staff amended the Bruce A and B licence condition handbooks to require the pre-distribution of potassium iodide pills in the 10-km affected zone by December 2015.

Bruce Power has acknowledged that they

will meet this new requirement by December of 2015.

In conclusion, Bruce Power has adequately responded to the Fukushima event and its emergency management program continues to meet all regulatory requirements.

Given that Units 3 to 8 have been operating for approximately 30 years, CNSC staff put emphasis on the aging management program. Over the past licensing period Bruce Power has addressed this regulatory focus area by establishing an integrated aging management program which includes plant condition assessments that assure fitness for service of all systems, structures and components.

These plant condition assessments feed into lifecycle management plans and are updated on a regular basis to continuously monitor the effects of aging.

Fitness for service of all systems, structures and components is assured through the implementation of an integrated management program. The CNSC regulatory document on aging management which was issued in 2014 is included in the updated licensing requirements.

In conclusion, Bruce Power is adequately managing aging of the plant through its

integrated aging management program.

As per similar discussions at previous licensing hearings, the Bruce A and B pressure tubes are reaching the 210,000 equivalent full-power hours, which is a design assumption made when the stations were originally constructed.

In September 2014 the Commission issued a temporary authorization for Bruce Power to operate Bruce B Units 5 and 6 beyond the 210,000 hours up to a maximum of 245,000 hours.

Units 5 and 6 were expected to reach this milestone before licence renewal. Details of the unit's full-power hours are identified in the next slide. However, CNSC staff have verified that Bruce Power has established programs in place to monitor the fitness for service of pressure tubes up to 245,000 hours and to implement corrective actions, if required.

These programs include engineering capabilities to assess the structural integrity of the pressure tubes, in-service inspections, and continuous inspection, testing and maintenance which are performed at every unit outage.

Ongoing research to validate the safety and integrity of pressure tubes indicate that

adequate safety margins exist for all units.

245,000 hours is a hold point, but not a cliff-edge effect. It is an indicator which notes when further assessments will be required. In the meantime, Bruce Power continues to monitor and inspect all pressure tubes and take appropriate action to maintain them.

In conclusion, the pressure tubes in all eight units continue to be fit for service and operational.

As previously mentioned, this table shows the current equivalent full-power hours as of January 1st, 2015 as well as the dates when each unit will reach the 210,000 and 245,000 milestones.

As previously mentioned, in September 2014 the Commission granted temporary approval to operate units 5 and 6 up to 245,000 hours. This temporary approval was based on Bruce Power's submission of inspection data and material surveillance, testing results, which indicate that the new model's predictions are conservative.

These results demonstrate that operation of all eight units beyond 210,000 hours is acceptable. Therefore, CNSC staff recommend the Commission extend their previous approval and make it

permanent for the operation of all eight units up to the next hold point of 245,000 equivalent full-power hours.

So another regulatory focus area is Bruce Power's submission of a complete Probabilistic Safety Assessment which builds on updating the Probabilistic Safety Assessments which were submitted in the late 1990s and early 2000s.

Bruce Power submitted the completed Probabilistic Safety Assessment to demonstrate compliance with the CNSC regulatory document on Probabilistic Safety Assessment.

CNSC staff have verified and accepted Bruce Power's methodology. CNSC staff also conducted a focused Type II inspection on the dominant contributors of the submitted at-power internal events models.

The inspection validated that Bruce Power's Probabilistic Safety Assessment followed the CNSC-approved methodology and demonstrates that the risk limits are met. This is discussed in more detail in the following slides.

However, overall, the CNSC staff concluded that Bruce Power is compliant with the current licensing requirements for probabilistic

safety assessments.

Bruce Power's, like most other nuclear power plants, operators utilize two internationally agreed metrics to assess the probabilistic risk of potential accidents at its stations. These safety goals are called severe core damage frequency and large release frequency.

Severe core damage frequency is a measure of the likelihood of releasing radioactive material from the fuel into containment. Large release frequency is a measure of the potential for the release of radioactive material to the environment from containment.

These metrics are quantified in the probabilistic safety assessments with the results expressed as a frequency of occurrence per year.

For example, the internationally accepted limit expressed as a likelihood of severe core damage frequency in a single unit is 1×10^{-4} or once in 10,000 years. These metrics ensure that the public and the environment risk from the operation of a nuclear station is negligible.

This table shows that Bruce A and B meet the safety goal limits for single units. For example, at Bruce A the severe core damage is assessed

at 3 times in 100,000 years for a reactor operation, which is significantly below the limit.

There is currently no internationally accepted whole site Probabilistic Safety Assessment methodology for station aggregation. The Canadian nuclear industry is leading the world in the development of such a methodology. However, a simple summation of the unit per hazard basis results in a single unit aggregation number that also meets the safety goal limits for both Bruce A and B.

Probabilistic Safety Assessments are one of the various studies used to improve safety. These numbers demonstrate that Bruce A and B stations are robust, have multiple defence provisions in place, and that all risk limits are met at both stations.

Another regulatory focus area was the assessment of the environment. Environmental assessments have been conducted for projects that were triggered under the *Canadian Environmental Assessment Act*.

The most recent environmental assessment under the *Canadian Environmental Assessment Act* was conducted in 2005 for the units 1 and 2 refurbishment project. In 2006 the Commission accepted the results of the environmental assessment

screening report for the project.

An environmental assessment follow-up program was undertaken by Bruce Power and is subject to CNSC staff oversight until its full implementation in 2017.

Bruce Power provides annual environmental assessment follow-up program reports to the CNSC staff. And CNSC staff are satisfied with Bruce Power's management of this follow-up program.

CNSC staff also continuously assesses the environment under the *Nuclear Safety and Control Act*. This environmental assessment demonstrates that Bruce Power continues to make adequate provisions for the protection of the environment. Bruce Power has ongoing environmental monitoring programs such as thermal impact assessments on whitefish.

Bruce Power continues to work towards the implementation of a series of CSA Standards on environmental management of nuclear facilities. This includes CSA Standards on environment monitoring programs, effluent monitoring programs, and environmental risk assessments.

In addition, CNSC staff also launched an independent environmental monitoring program around the sites. CNSC staff independently monitor results

to confirm that the public and the environment around the Bruce A and B stations are safe.

CNSC staff's independent environmental monitoring program results are consistent with the results submitted by Bruce Power, confirming that the licensee's environmental protection program protects the health and safety of people and the environment.

These results are published on the CNSC website and demonstrate continuous improvement efforts at the CNSC.

In conclusion, CNSC staff are satisfied that Bruce Power is making adequate provisions for the protection of the environment.

Bruce A Units 1 and 2 were refurbished and returned to service in late 2012. Currently, Bruce Power has not submitted an application for refurbishment of the remaining units.

In preparation for the licensing beyond 2020 Bruce Power will be moving to a periodic safety review process to support long-term operation.

Bruce Power plant is to submit a full periodic safety review no later than 2019. A periodic safety review is an assessment of the current state of the plant and its performance to determine the extent to which it conforms to applicable modern codes,

standards and practices and to identify any factors that would limit safe long-term operation. The Bruce Power reactors remain safe to operate for the next licensing period.

Bruce Power must return to the Commission if a decision is made to refurbish any unit in order to obtain Commission approval to initiate the refurbishment project.

A licence condition to this effect has been included in the proposed licence. Should Bruce Power decide not to refurbish any unit, there is also proposed licence condition on end of commercial operations. These two new licence conditions are discussed further in slide 27.

Moving to other matters of regulatory interest. Early in the review process First Nations and Métis groups who may have an interest in the Bruce Licence renewals were identified, provided information about the project, encouraged to participate in the public hearings, and offered an opportunity to apply for the funding through the CNSC participant funding program.

In December 2013 CNSC staff sent notification letters to the identified aboriginal groups in the Bruce County area, which include the

Saugeen Ojibway Nation, the historic Saugeen Métis, and the Métis Nation of Ontario.

CNSC staff made themselves available to meet with interested groups to discuss the Bruce licence renewal applications and are committed to continuing these discussions.

Participant funding was made available to assess members of the public, Aboriginal groups and other stakeholders, to participate in the CNSC regulatory process for the Bruce A and B licence renewal. A total of \$49,350 was awarded to 8 applicants, with two applications still pending review.

In terms of financial guarantees, Bruce Power is in compliance with the *CNSC Cost Recovery Regulations* and the \$14.2 billion in financial guarantees were accepted by the Commission in 2012 and remain valid.

Finally, Bruce Power has a robust public information program and is compliant with all regulatory requirements in this area.

During the last licence renewal process for Bruce A and B in 2009, CNSC staff introduced a new format for the Power Reactor Operating Licence and the first Licence Conditions Handbook.

Since that time, and the issuance of the current Bruce A and B licences and Licence Conditions

Handbooks, CNSC staff have introduced many improvements based on operating experience gained from the use of the Licence Conditions Handbook. This has led to the development of standardized licence and Licence Conditions Handbook templates and the refinement of the Safety and Control Area framework in 2010. The proposed Bruce licence and Licence Conditions Handbook take these continuous improvement activities into account and are discussed in more detail in the following slides.

The proposed operating licence follows the simplified format adopted from other recent Nuclear Power Plant operating licence renewals. CNSC staff are proposing to combine the current Bruce A and B licences into a single licence and a single Licence Conditions Handbook. Consolidation will streamline administrative changes to the licence and/or Licence Conditions Handbook, improve coordination in ensuring compliance and increase transparency to the public.

The proposed licence includes standard licence conditions that make reference to licensee programs.

Specific CNSC regulatory documents and CSA standards have been moved from the licence to the Licence Conditions Handbook.

In addition to the standard licence

conditions for the 14 Safety and Control Areas, the operating licence also includes site-specific licence conditions that cover the following activities:

1. Changes to the lease agreement between Bruce Power and OPG;

2. Continued operations and the requirement to return to the Commission for approval to undertake a refurbishment or major component replacement project for any unit;

3. Notification to the Commission and provision of a plan if Bruce Power decides to end commercial operations of Bruce A and/or B;

4. Management and storage of the booster fuel assemblies at Bruce A;

5. Implementation and maintenance of a nuclear criticality safety program; and

6. Implementation and maintenance of a program for the receipt, storage and handling of the prescribed substance Cobalt-60 at Bruce B.

I would note that four of these six site-specific licence conditions are in the current Bruce Power operating licences, while the two on continued operations and end of commercial operations are being proposed as new licence conditions.

The proposed operating licence and

associated Licence Conditions Handbook reflect the continuous nature of safety improvements for Canadian nuclear power plants and its regulator.

Bruce Power is compliant with all existing regulatory requirements. Since 2009, many new or revised CNSC regulatory documents and CSA standards have been updated. Bruce Power has performed gap analyses and provided transition plans with implementation dates for all these new regulatory requirements and CSA standards.

CNSC staff will update the Commission via the annual CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants report. In the meantime, Bruce Power has adequate measures in place for all Safety and Control Areas.

A total of 25 new or revised CNSC regulatory documents and industry standards have been added as updated requirements in the Licence Conditions Handbook. This means that the current requirements are being replaced by a newer version of a CNSC regulatory document in the spirit of continuous improvement.

There are 15 new or revised CNSC regulatory documents that are being proposed as updated requirements for the next licensing period of 2015 to 2020. The implementation dates listed were accepted by CNSC staff. As you can see from the table, many of the updated

regulatory documents will be fully implemented by Bruce Power when the proposed licence and Licence Conditions Handbook are to come into effect on June 1st, 2015.

In addition to the CNSC regulatory documents, there are also 10 updated CSA standards being proposed for inclusion in the Licence Conditions Handbook. The implementation dates of these CSA standards are listed in this slide.

CNSC staff will continue to update Commission via the annual CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants report on the progress of these continuous improvement activities.

On November 28th, 2014, Bruce Power made several requests to the Commission in a supplemental information submission in support of their licence renewal.

As part of the recommendations for licence renewal, CNSC staff request that the Commission consider the inclusion of an earlier version of the CNSC Regulatory Document on Accident Management until residual issues with the newer version are resolved. CNSC staff recommend that the Commission accept this request made by Bruce Power.

CNSC staff also recommend that the Commission consider the inclusion of the CNSC Regulatory Document on Emergency Preparedness as a new licensing requirement. CNSC staff consulted with Bruce Power and

have reached an agreement to include this Regulatory Document in the Licence Conditions Handbook with a clarification that Bruce Power is compliant with Clause 2.2.6 of the Regulatory Document, with the current location of Bruce Power's Emergency Management Centre.

The third request was to exempt Bruce Power from carrying out "qualified third party" reviews as per clauses 4.5.1 and 5.9.2.4 of the CSA standard on Fire Protection. Bruce Power has recently withdrawn this exemption request and will instead pursue this issues regarding these clauses with the CSA N293 technical committee to allow for a more fulsome discussion with other industry stakeholders who also use this standard.

In conclusion, CNSC staff recommend that the Commission consider the inclusion of the two Regulatory Documents on Accident Management and Emergency Preparedness and Response as new licensing requirements.

CNSC staff also recommend that the Commission do not exempt Bruce Power from carrying out third-party reviews on fire hazard assessments until the issues have been resolved with the CSA standards committee.

I will now turn over the presentation to Mr. Howden for concluding remarks.

MR. HOWDEN: Thank you, Mr. Lafrenière.

Based on the assessment of Bruce Power's

safety performance, CNSC staff conclude that as per section 24(4) of the Nuclear Safety and Control Act:

- Bruce Power is qualified to carry on the activities authorized by the licence; and

- In carrying out the licensed activities, Bruce Power has made and will continue to make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

I would now like to provide CNSC staff's overall recommendations before closing.

In regards to Bruce Power's request for licence renewal of the Bruce A and Bruce B Nuclear Generating Stations, CNSC staff recommend that the Commission accept CNSC staff conclusions and recommendations presented in CNSC staff CMD 15-H2 and our presentation today.

As Mr. Lafrenière has described, I would like to reinforce that there are many proposed improvements cited throughout the CMD where CNSC staff have provided recommendations to the Commission for the inclusion of new or updated documents in the Licence Conditions Handbook.

The intent of the recommendations is to promote continuous improvement by providing clearly

documented requirements to Bruce Power. In many cases, the documents represent a codification of existing regulatory requirements; thus, Bruce Power already meets those requirements. In some cases, the documents present updated regulatory requirements and thus an implementation period is required to fully meet the requirements and thereby continue to improve safety.

If the Commission renews the operating licence for Bruce A and B, CNSC staff request that the Commission accept the inclusion of these documents in the Licence Conditions Handbook.

CNSC staff also recommend that the Commission renew a single Bruce A and B operating licence with an expiry date of May 31, 2020 and consider the Licence Conditions Handbook in the decision to renew the operating licence.

In particular, and as discussed in slide 31, CNSC staff recommend that the Commission consider the inclusion of the two CNSC REGDOCs on Accident Management and Nuclear Emergency Preparedness and Response as new licensing requirements. These are specific requests that Bruce Power made in a supplemental submission in November 2014.

CNSC staff also recommend that the Commission authorize the delegation of authority as set out

in CMD 15-H2. Section 4.9 of the CMD indicates that there are three licence conditions which mention a "person authorized by the Commission." These licence conditions are:

- Licence Condition 3.2 regarding restart of a reactor after a serious process failure;

- Licence Condition 15.2 regarding continued operation or refurbishment of a unit -- this is a requirement to notify the CNSC and submit appropriate information; it does not authorize refurbishment or continued operation beyond the end of the proposed 2020 licensing period;

- The third Licence Condition (15.3) regarding end of commercial operation of Bruce A and/or Bruce B is a requirement to inform the CNSC and to submit plans for transition to a safe storage state.

For these delegations, CNSC staff recommend that the authority for allowing these three conditions to occur is delegated by the Commission to the Executive Vice-President and Chief Regulatory Operations Officer, who can further delegate this authority to the following two staff:

- the Director General of the Directorate of Power Reactor Regulation; and

- the Director of the Bruce Regulatory

Program Division.

Notwithstanding this delegation of authority, Commission approval to initiate a refurbishment project would still be required.

Finally, CNSC staff recommend that the Commission authorize Bruce Power to operate units 1-8 pressure tubes up to the hold point of 245,000 equivalent full power hours.

I note that Bruce Power is asking for 247,000 hours in this presentation. CNSC staff can support this. Originally, Bruce Power did not provide a number, so we chose 244,000 (sic), which was the lower end of the range of assessment and was equivalent to the temporary authority that the Commission issued for Bruce units 5 and 6.

In closing, I wish to reiterate that Bruce A and B are operating safely and do not pose a significant risk to the health and safety of Canadians nor to the environment. Bruce Power has also implemented adequate safety measures to continue safe operation of the Bruce A and B Nuclear Generating Stations until the end of the proposed licensing period in May 2020.

Thank you, Mr. President and Commission Members. We are prepared to respond to any questions you may have.

In particular, the submission from Greenpeace has posed a number of questions and requested info. We are just reviewing the submission now. However, we are in a position to comment on the section "Confirmation of Licence Compliance" regarding probabilistic risk assessment and the Fukushima Action Plan compliance if you wish us to do so.

Thank you.

THE PRESIDENT: Okay. Thank you.

I think we're going to take a 15-minute break and reconvene around 11:00.

--- Upon recessing at 10:49 a.m. /

Suspension à 10 h 49

--- Upon resuming at 11:05 a.m. /

Reprise à 11 h 05

THE PRESIDENT: Okay, we're back.

I would like now to open the floor for questions from Commission Members and what we're going to do is we're going to do rounds of two questions each. We have a lot of material to cover, so two questions per colleague and as many rounds as we need.

Mr. Howden.

MR. HOWDEN: Yeah, I just want to correct.

At the end of the last session I started using the number 244,000 when I meant 245,000.

Also, Ramzi Jammal is prepared to respond to Greenpeace at any time that you wish.

THE PRESIDENT: We're not going to deal with the Greenpeace issue. If you guys want to weave it into your discussion, it's up to you.

Okay. I would like to start with Dr. McDill.

MEMBER MCDILL: Thank you. It's good to be back.

With a limitation of two questions, I'm going to hop over some introductory remarks and go straight to the point.

I'm looking at the "Summary of the Methodology and Results of the Bruce A and Bruce B Probabilistic Safety Assessments" and, although I have a bunch of other questions which we'll get in other rounds, my first question is on the Licence Control Handbook.

Looking at the station aggregation -- and I realize station aggregation is new and coming and these numbers are early numbers. In terms of Bruce A versus Bruce B -- these were also in the presentation by staff -- could I ask both staff and Bruce to talk to me about uniting two such different stations under one Licence

Control Handbook?

For example, Bruce A's large release frequency, less than 1 in 100,000, versus Bruce B, 5 in 1 million.

THE PRESIDENT: Which --

MEMBER MCDILL: I'm on -- I'm looking at the "Summary of..."

THE PRESIDENT: You're not looking at the CMD, you're looking at --

MEMBER MCDILL: No, but the numbers also appear more or less here.

THE PRESIDENT: Okay.

MEMBER MCDILL: But I'm looking at -- this was on Bruce's website.

MR. HOWDEN: I can bring up that slide.

MEMBER MCDILL: Thank you.

--- Pause

--- Discussion off the record

MEMBER MCDILL: So these -- even given the differences in doing aggregation at this point in time with a mathematics that's still developing, is it good to bring two such different stations under one Licence Control Handbook?

MR. LAFRENIÈRE: Ken Lafrenière for the record.

The answer is staff believe that it's advisable to do so. So, to do that, we have to go back into a little bit of history. Bruce Power have a unique set of same programs that run both facilities and they can speak to that.

So staff essentially assess the programs independently. However, combining the requirements in one place allows administrative management of the programs in the Licence Conditions Handbook to be much easier so that the consistency is the same. You won't have to go and change one Licence Conditions Handbook for another and make sure that you're always in step-change with those administrative type changes.

So we report on the performance separately of each station. We assess the performance separately. However, much like the *Nuclear Safety Control Act* and the licence and the Regulations apply to the facilities, we want to combine the licence so that we have one source of regulatory requirements, compliance verification criteria that is consistent across both facilities.

MEMBER MCDILL: Bruce...?

MR. SAUNDERS: Frank Saunders for the record.

I think it's worth pointing out that where they are appropriately different -- the LCH has notes where

it's appropriate. So for things like the operating policies and principles -- or the operating limits that we call them these days -- those things are different for the two plants and they're reflected as different and so forth.

From a Bruce Power point of view, we're kind of benign on whether it's one or two licences. It's really of no significance to us one way or the other but it does solve an administrative burden, so we're certainly okay with it. We don't have a problem with it.

MEMBER MCDILL: I think Ramzi had his hand up.

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

Just to add to Mr. Lafrenière's comment, again, I reemphasize the fact that the regulatory requirements are the same. I would just like to note to the Commission that the Licence Conditions Handbook is a draft as proposed.

So for the sake of clarify or public communication, we'll be more than happy to address the Commission's requirements but I would like to emphasize the fact that the Licence Conditions Handbook exists for that flexibility, stemming from the regulatory requirement for both Bruce A and B are the same and the Licence Conditions Handbook to provide the clarity.

MEMBER MCDILL: Thank you.

My second question appears from page 31 of staff's submission. It appears in a couple of places. So I would like to address this as if I were an intervener. Under Section 2, "Impact of Aging on the Safety Analysis Margins", in the third paragraph it says:

"...Bruce Power conservatively overestimated the physical effects of aging."

And then in 3, under "Coolant Void Reactivity" -- and these are staff's words, I think, because they don't appear -- at least I couldn't find them in Bruce's submission.

"In December 2012, Bruce Power reported ... that a recent re-evaluation of uncertainties in predictions ... concluded that the systematic over-prediction credited in analysis of large (loss of coolant accident) postulated event has been overestimated."

So the over prediction was overestimated.

And then:

"... the impact of this finding ... [is that there is] no safety concern

... for large ... LOCA..."

And if you turn the page and it continues a bit and it refers to "Bruce Power evaluation [46]".

So pretending I was -- because this overestimation of over prediction was an interesting thing so I started looking and 46 is an e-Doc 4260036 so I wanted to find out about this overestimation of over prediction, and it is a letter to Mr. Lloyd from Frank Saunders. That's good.

So it said what the three attachments were. I started looking and you don't have this in front of you, so I am going to have to -- there were three attachments. Each of the three attachments had several attachments. They refer to a variety of references.

So the large LOCA in the first attachment refers to Reference 4, which is -- I hope the individual will forgive me -- A.S. Seraki(ph), large LOCA, Bruce. And then I went to the next attachment, which is very similar, and it refers to the work documented in "Error: Reference source not found". And then I went to the next one, which is again the same, and it refers to the same words. It refers to reference 5F, "Adams coolant void reactivity by its closure report". So I thought if I were in intervener this would be terribly puzzling. And then of course you look at all the attachments, one of which I wanted to read,

and it says, "See the CD".

So from an intervener's point of view this document 40 which is referred to, "a detailed Bruce Power evaluation" isn't accessible to the public, and I think probably should be. I guess the public can ask for the CDs. Presumably they are huge CDs, voluminous if they are on CD, but my concern is, for such a big, important license renewal the documentation isn't there, isn't online as promised by everybody. So I would ask some comments.

You can also comments on the overestimation of the over prediction if you like. Which way does that go if you overestimate the over prediction?

MR. SAUNDERS: Yes. It's Frank Saunders on the record.

Perhaps a little bit of discussion and background on the large LOCA information first. It has been an issue that has been going -- it was one of the CANDU safety issues, as you know. It has been an issue since the mid-'90s and we worked a great deal -- in fact we are just finishing up the summary report on that to submit to the CNSC staff next month.

What we did in the interim was develop some interim safety limits that we could use that we knew were safe until we finished all of the analytical work around large LOCA that was required. So when you refer to

the overestimation, this was just really we were setting those interim safety limits and making sure that they had a large safety margin and so that there wasn't any particular challenge and that was the analysis that was there.

And, yeah, we try to make everything as public as we can, except we do some restricting around accident scenarios where people could potentially take advantage of them to initiate some kind of, you know, action on the plants to cause damage. So some of the sequences we do keep confidential.

The big issue with them, as you refer to, it's on a CD, is that many of these analyses turned out to be 30 and 40,000 pages long, right. They are highly complex computer codes, and so forth. So at some level there is not significant value giving them to the public. If there is no actual security issue with them we don't have any problem with giving them and we haven't had any requests along those lines. But some of those sequences, especially the ones in the PSAs we don't directly release because it does tell people where the important equipment is and what it is, and so forth, and therefore facilitates the ability to do harm if you really wanted to.

THE PRESIDENT: But just for the record, I just want to clarify something. I think we fought long and hard and I think we recently clarified that any document

that is referenced in the staff CMDs or in a proponent's CMD should be available unless it is a security or commercial kind of confidence. So what I want to know is, does staff check to see that all those references, somebody goes on and actually checks what Dr. McDill does or has done just to make sure that they are available? And where not available maybe somebody can put, "Only on request", or whatever.

Staff...?

MR. HOWDEN: So Barclay Howden speaking.

Yes, with regards to the reference documents they are all available. We normally don't do it on request because of the volume and I think you have shown the sort of domino effect as you drive through that perhaps there are some that are not available, but we have been striving, as the President has said, to bring as much available as possible because you may recall we have had references before that weren't available, which is really not useful for anybody.

MR. JAMMAL: Ramzi Jammal, for the record.

I understand your frustration. There is no if or butts about it. At the same time, as the President mentioned, we just finished -- actually, through the Secretariat formally declared that in every CMD any reference we make a CMD will be available publicly.

As we are going through this process -- that's why the process of the part 1 and part 2, to allow the interveners the capability to request the information and as we go through the process of making things available online upon request, because -- I hate to say what I am going to say, but if we are going to post it ourselves, there is the translation issue, and so until we fix that element. With respect to reference to the CMD, and posting as the CNSC itself we are working on this procedure.

But definitely there are two things. I understand the frustration. At the same time we are allowing the period between Part 1 and Part 2 and any request from interveners will be provided to them with the information.

MR. LAFRENIÈRE: Ken Lafrenière.

I was going to answer your specific question. So under Section 2 we were discussing impact of aging. Under Section 3 we are discussing non-aging impact.

So in the first case, the overestimation, what that referred to is the assumptions you make in the analysis. So for instance in 2009 they submitted analysis with the various assumptions and they physically -- some physical parameters that they measure during outages, they assume for instance a diametrical creep will be in 2014.

When they go back in 2014 and measure,

physically measure the units, they determine that they overestimated all those aging related effects, so for instance the diametrical creep, what might have been whatever value, "X", it was "Y", which is significantly lower than "X", so is essentially the effects for aging are conservative. So that's the first one.

The second one was the CVR is under a process. It's under the S99 well, currently the 3.11 reporting process, and essentially they use the similar words -- so I understand your confusion -- "the overestimation of the core void reactivity value" which is used in analysis. That overestimation was discovered via research. They reanalysed using the proper value and demonstrated that there is no safety impact.

MEMBER MCDILL: Thank you. I understood the difference. It was mostly if you are an intervener reading this it is a little puzzling, and then if you try and find this reference 46 it's a little -- and I understand that we are not talking about a simple thing here. This is a big, complex animal. But it is just very frustrating when in the actual online it says "reference source not found". And the same -- I think it's the same paper is referred to two different authors and "reference source not found", so three different attachments, three different -- and I know it is hard to catch all of these.

The other comment I would make is there is no return letter. Maybe there isn't one, but there is no return letter back to Bruce where a proponent can see that this has been approved except by statement. So "CNSC staff have completed their evaluation regarding the large break loss of coolant accident and found the assessments acceptable", but there is no way for an intervener to find that letter either.

So it's only a comment. I have many more, but there is two questions in this round. so I think from an intervener point of view some of this is going to be very frustrating, so maybe by Day 2.

Thanks, Mr. Chairman.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: Thank you, Mr. President.

So from these submissions this clearly is a good news story and I was particularly impressed with all the new hires and the change in your demographic profile and it seems to have been done rather seamlessly without any of the normal incidents or concerns one has with getting new staff so, as I said, good news there.

I wanted to get clarity around the equivalent full power hours, one from Bruce on -- there was nothing in your written submission on what your request was. In your slides it is the 247,000 equivalent full

power hours and we have just heard from staff that they are okay to support that. Yet, all the slides were around 245, so I think I could connect the dots on that.

But I wanted to hear from Bruce Power why there wasn't an initial request on exactly what has been approved and then from staff just to confirm that for Pickering we did -- the Commission did approve -- I think it was 247 equivalent full power hours.

MR. SAUNDERS: Yeah. Frank Saunders, for the record.

It was really a result of the change in the hearing dates. So the initial 245 was more than adequate to get us to the end of the original license date when we changed the hearing and moved it six months and it just crosses over the 245 threshold.

And there was no particular safety reason to be 245 versus 247, so our intent was just to reach the end of the license period since it was demonstrated and that was the whole of it, and that was it.

MEMBER VELSHI: Thank you.

My second question is around industrial safety and the performance in that area and recognizing that certainly, compared to other industry benchmarks it is excellent performance, but as I look at the historical performance, so this is on slide 10 of the Bruce Power

submission, as well as page 38 of the written submission, last year's performance seems to have been the worst in the last seven years.

So there are a couple of questions in this. One is that even during the refurbishment period when there is probably more high risk activities going on, didn't seem to have had that kind of performance.

So one is, are you concerned with this? I'm not saying it's a trend. It is just the one year. But are you concerned with that?

And, secondly, does this include contractor's performance as well?

MR. HAWTHORNE: Yes. For the record, Duncan Hawthorne.

As far as I am concerned, I am always concerned when someone gets injured. When you look at all 2014 there is really -- one of the things is we are collecting all data. So if someone slips and falls in a car park and has an injury, then that is going to hit us here and so as an example of that which happens in winter weather. It's not an excuse. It's all part of the metric.

The other one which we were concerned about is we did have an injury in 2014 related to a hand injury when someone was working around -- well, I say -- no, actually working around rotating equipment but being

distracted enough to put his hand on equipment that he wasn't working on while he was in the area.

So, you know, the problem is when you have such a stellar safety record that even one event puts you above, you know. Having a year of zero in 2013, the year 2014 is going to look bad compared to it, even if we have had a couple of very minor events. But, you know, as far as we are concerned we follow it up. If you take that specific example, it was a supervisor who had been in the area, distracted, speaking to someone and putting his hand on a piece of machinery to wipe off dust without realizing the machinery was still alive. So you know, I see that as a human performance type thing.

We have actually had that supervisor appear in our monthly safety video and explain what he did and how he felt about that and used that as a teaching moment for staff. But no, I'm not -- yeah, as I said, I'm not concerned that it represents a trend. I am concerned that anything happens at any time.

MEMBER VELSHI: So my second part, do these statistics include your contractor workers as well?

MR. SAUNDERS: Yes. All contractors that we supervise are included in there, yes.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Monsieur Harvey...?

MEMBRE HARVEY : Merci, Monsieur le Président.

My first question is addressed to the staff. On page 16 of the staff CMDs, it's about the minimum shift complement. We can read that on 12 occasions during your current licensing period, where on 12 occasions the minimum shift complement was not met. And reading the text after that we can see that the cause is the staffing and the organization of the staffing. I understand that the staff reviewed this event and there was no impact on the safety, but my question is, is the shift complement an obligation or is it just something that you have to --

MR. LAFRENIÈRE:: Ken Lafrenière, for the record.

Yes, it is a license requirement. By license condition they have to maintain a certain amount of staff in positions.

MEMBER HARVEY: So it should be met at all times?

MR. LAFRENIÈRE:: Ken Lafrenière, for the record.

Yes. I will point out that this statistic is 12 violations over the five-year period, which is insignificant and I will just give you the nature of a violation. If somebody reports on a minimum shift

complement that is not a crucial person, so for instance the minimum shift complement might include stock personnel so that plant staff have access to material and they fall sick during the day, Bruce Power will send that individual home, or to seek medical help and they will call somebody in.

So these are like two or three hours during that intervening period, but they still are minimum shift complement, but that is the detail of oversight we have in this area.

MEMBER HARVEY: Yes, but when you read that in the public reads that, it's difficult to get the importance of that and if it's an obligation, it's an obligation, so it has to be. So I won't read all the other pages.

But on page 20 -- this is on 3232 -- each year more -- and those are certified and added to the pool of available resources on the shift and this is what should solve the problem, if I understand well the other pages. And CNSC staff expect Bruce Power's staffing plan to achieve optimal staffing level by 2007 in two years to greatly reduce the current number of hours of non-conformance. So why not saying to eliminate?

I would like to hear also Bruce about that. We say we hope in the two years that the problem

will be lower, so why not eliminate?

MR. HAWTHORNE: So, for the record, Duncan Hawthorne.

If I can just kind of separate out two things, because you are sort of connecting two dots and assuming they are the same.

MEMBER HARVEY: Yes, I do.

MR. HAWTHORNE: The first one is -- the second comment is related to authorize nuclear operators and a number of licenses on the site. Each year when the CNSC is doing your annual report you can see the number of licenses. We actually have qualified people as compared to other licensees and you will see that we have continually increased that.

So, yes, we, as I mentioned in my own remarks, we are increasing the number of licenses available on-site and that is our work-life balance thing for us as much as a minimum complement. You know, we have had -- in the past we have had high levels of overtime worked by licensed staff as opposed to having a deeper pool of licenses. So I think the intent of that is to ensure that we always have an adequate supply of authorized nuclear operators.

Your first comment is related to minimum staffing, which is not specific to people in the control

room. It is related, as Mr. Lafrenière said, to people who happen to be in a complement for other reasons and there have been occasions of very short-term violations. We live in a very remote area so there could be occasions when we have to keep staff on-site because the roads aren't open and we make sure we have staff to do that. There could be occasions where someone -- the way the rules work I think it's appropriate they are transparent, but I take your point about explaining to the public.

For example, if I am a control room operator and I am working in, say, the licensed building and I leave there and go outside the site boundary to go to visit the nurse or to go and get something from stores, I can create a minimum complement violation, not because I have left the Bruce Power site, but because I have left the site boundary.

So these kind of short-term things are things that we are reporting and so there is a question of degree. One issue is, do I have enough licensed staff to, I say, run the plant safely and we have explained that we are on a case of that.

The second one is are the short-term variations that we are reporting and making sure we manage and the two are different, in my view, but they need to be explained because you make a good point, you can easily

draw the two together and largely the same way as Commissioner McDill did with the two comments about overestimation of two different topics, but they are on the same page and you think they relate to the same thing, or you could easily assume, and in the same case you have done the same here.

MEMBER HARVEY: Yes. Sorry.

THE PRESIDENT: Well, I consider myself to be part of the public and when somebody says to me that you need to have a minimum shift complement, to me I equate this to critical jobs and critical jobs in the nuclear business, I equate this to a safety issue. So yeah, somewhere along the line you are using different kinds of words. Actually in the presentation you made 180 certified licensed kinds of staff and then the minimum shift complement. Which one is the critical number that we should not allow you guys to not comply with?

MR. HAWTHORNE: Well, yes, I think that maybe I explained that poorly, but my logic is that it is very clear in the regulatory documents how many control room staff we had, how many licenses we need to have, what the licensed positions are and it is very clear that that is the complement that is necessary to operate the units.

In addition to that, there is a staffing requirement for the site and they are not the same. You

know, I have -- you know, some of this nomenclature needs to be improved. It's the same as every year we sit here in front of the Commission and we see a statement that talks about missed mandatory tests and I think, well, if they are mandatory how is it okay to miss them? That's about nomenclature.

As an industry if we value communication, we are going to have to be a bit more thoughtful about how we communicate. If you say something is mandatory that sounds to me like you must do it. And minimum staff complement sounds like you should never, ever go below it. So I accept the point, but everything else we are doing is risk informed and risk based and we have to kind of apply some degree of what does that mean? If I have four units running and I only have three operators in the control room, that is something we should all be really concerned about.

If I don't have a guy serving materials at the desk in a warehouse that's an efficiency issue, but if he is counted on a minimum complement and he is missing for 30 minutes, does that count as the same safety consequence? That is a question for us to think about because I think you are making a good point, but they are not the same and we use the same language.

THE PRESIDENT: Monsieur Harvey...?

MEMBER HARVEY: The second question is on page 47 of the CMDs, the staff CMDs. It's about the shutdown systems. Maybe once again I don't correctly read that, but I would like to have some explanation.

My comprehension is we have two systems that have to be operational all the time and here it's difficult too because there are some sentences I see -- at the bottom of the page, the last paragraph, for Bruce A all special safety systems met their unavailability targets in 2003, with the exception of the emergency coolant injection system and shutdowns too, for Units 1 and 2. So would you explain that, because to me it appears that one of the systems is not working which should not be the case. So maybe just clarify it for me.

MR. SAUNDERS: Frank Saunders, for the record.

I will start this one and may turn it over to our chief engineer there once we get going. So the way the system is designed and the way the license works is that systems that are important to safety have reliability targets. So the emergency core injection system for example has a reliability target, both a reliability target for now and a future predicted reliability target that we need to maintain. So the system is available and those are quite restrictive from what they do. So the system is

available, but if something should happen that for some reason affects --you lose that system for a short period of time -- then you count that in your reliability numbers and it can take you below target, which is what it did in these cases.

And I can give you an example on the Bruce B, the containment issue. This was actually the air-locked doors leading in to do maintenance into containment. It was in a Bruce B outage.

We were using the doors a whole lot, but we still check the seals on the doors to see that they are performing their function. At one of those checks both seals on the inner door and the outer door failed so that put us -- that created an impairment. The way you do the calculation in our system is, unless you know exactly when it failed you assume it failed from the last -- from at least half the time from the last test, right? And so you put that in.

Now, we repaired it right away. The unit was in a guaranteed shutdown state anyway, so there was no actual risk, but it still counts on our reliability numbers. So it is a very conservative approach, but it really forces us to maintain systems in a highly reliable state, that is the purpose of it.

So I guess that is the background

explanation. We can go into the individual ones here, if you like, and explain them.

MR. HOWDEN: Yes. Barclay Howden speaking.

We would like to comment on this. So this discusses unavailability targets and when we reviewed the text in the past few weeks getting prepared we realized that the text was very difficult to follow so I am just going to ask Mr. Lafrenière to describe a little bit of the safety significance of these events and what we considered when reviewing them.

MR. LAFRENIÈRE: Thank you, Barclay.
Ken Lafrenière for the record.

So I think by example might be the best way to work our way through this, so we will use the example that Bruce Power was talking about.

All this text, which regrettably we can improve the wording on, originates from formal regulatory requirements, reporting requirements. These originate from the annual reliability report which has strict engineering speak to engineering -- to an engineer, to a specialist at the regulatory body. So they use terms that regrettably can be taken out of context.

So in this case the airlocks which perform a containment function which, the safety of that event, of

the loss of containment event, when a unit is shutdown, is minimal; there is no driving force. They don't have the risk of nuclear accidents -- is minimal. However, they do air holding tests on two of the four seals and the air holding test fails, so they consider that a Level 2 impairment.

I don't want to use the terminology that our reliability specialist used, but basically the system -- they take an impairment on a system, but the system would actually work. We have confidence it will work, but you've lost defence and barrier to the system. So they report it as a non-availability.

So when I report back to the Commission, if it is a significant event, I will talk to you about this in an event initial event process. If it is a non-significant event, which is what we try to word in this text, that is the logic behind it, essentially that we get these things reported to us, we know the systems are available. They will work if called upon.

These are minor losses of redundancy, but because of the oversight nature of this business of how we get into every aspect of the reliability program and the performance of systems, we feel obligated to have to report through our CMD processes, our annual reports, the performance of these systems. But I can tell you that, in

an actual event, all these systems are available 100 percent of the time to respond to any accident.

THE PRESIDENT: Okay. Before Mr. Jammal -- just so you understand, again, this is another area where maybe it is language, but I have to tell you the system, the shutdown system 1 and 2, some of you remember in other public hearings was a big, big issue because we always argue that the CANDU design have those two safety systems to make sure that it is absolutely safe. So every time you talk about unavailability you raise angst.

One of those ways of maybe dealing with that, I'm sure you have some benchmark that you can actually measure. I don't know if it's 99 percent available and only not available during particular -- you need more explanation rather than all of a sudden say that one of the critical shutdown systems is not available.

Mr. Jammal...?

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

I concur with what you just said, Mr. President, because I personally had to respond to an intervener on unavailability of data of safety systems and over -- I'm just going by memory -- the memo I have written to the Commission in response to the intervener at the time who declared that the staff were not being accurate in

presenting their information to the Commission. And over the seven year period that I have asked staff to review, we are talking of probably a fraction of a minute where a system was not available and that was during a shutdown of reactor.

One thing I would like to confirm to the Commission, that no reactor is allowed to operate without the availability of the shutdown system. If there is an impairment that is impacting the two independent shutdown systems, the reactor is shut down immediately.

So I take it back and I accept the fact that there was confusion how the text is being presented from a data perspective, but I would like to conclude that no reactor is allowed to operate without the safety systems that are available at all times. If there is any impairment or unavailability, that machine is put into the safest state, which is a shutdown mode.

MR. HAWTHORNE: Mr. Chairman, if I could just add? It's a comment I have made before about considering the audience. There is a paragraph here which could've been the very first paragraph which says what Mr. Jammal just said, no reactor is allowed to operate without the availability of the safety systems. So that would be the first paragraph in that section.

However, CANDU plants are designed with

multiple redundant systems and in order to ensure defence in-depth, this CNSC staff monitor the total of availability for any system, including the availability of those redundant systems. That's how I would have written that because I do agree that actually we are doing a disservice to the CANDU design. We all understand it and we can talk that way all the time, but what we stand by telling people is that there is never an occasion where we will operate any reactor without the availability of these systems. That is the statement we should make at the beginning and never has that happened, because that is a reassuring statement.

But then we are actually trying to extol the virtues of what I think that CANDUs have more than anything else which is, you know, a built-in redundancy. And if we can think about communicating that we would have a lot easier time.

THE PRESIDENT: Monsieur Harvey, c'est fini?

MEMBER HARVEY: Yes. You are right, the sentence is there, Mr. Jammal, and you mentioned no reactors at all. But after when you read the section and normally we read from the top cover to the end, so when we read that, despite the fact that we see that sentence, which is a sentence like any other in the text so then you

are not certain that you have understood the text or if that sentence is not correct.

THE PRESIDENT: Okay.

MR. SAUNDERS: The other thing maybe we should point out is that there are very strict shutdown requirements in our OP&Ps which are approved by CNSC staff so we could not run if we wanted to. So if, for example, shutdown on System 1 wasn't available we would have to come offline immediately, right?

So these are already built-in so, you know, that level of safety is already in our operating requirements as well.

THE PRESIDENT: I am offering a suggestion since most of the writers here are engineers or technical people and they cannot help themselves, maybe you could use numbers to make the point. If the availability is 99.9 percent over -- that's a different kind of a way of demonstrating this and I think you have those numbers around. So sometimes you can use those numbers to explain something a bit better. Okay, we have to move on.

Mr. McEwan...?

MEMBER MCEWAN: Thank you, Mr. President.

I would like to start with page 41 of the Bruce CMD and that references back to page 68 of the staff CMD. So in the second paragraph you make an interesting

statement and I'm not sure what it means, and it's not referenced at all in the staff CMD, Bruce Power engages in "significant research activities through independent peer-reviewed research". That's almost an oxymoron. If you are engaging in it, it really can't be independent.

So I would like to understand how that independence is defined, how it is funded. It would have been very helpful to have a list of publications because that would, I think, gives somebody reading this document a sense of just how rigorous this research is. And this statement for the NSERC grant, which is a very large NSERC grant for the research term, a Bruce team or the independent team?

So I think we need to explore that and also, then, understand why the staff haven't referenced that at all in the CMD.

MR. SAUNDERS: Yes. So we can answer those questions. Frank Saunders, for the record.

It is independent research carried out through universities. We fund it, right, and to some degree of course we set the interest level of what we are interested in funding. The NSERC grant was based on a research program that we had started with McMaster and Regina. In total we are in the order of \$4 million or so that we are putting into these R&D programs. We can

certainly bring you back -- in fact, the researchers asked if they could intervene on Day Two and I told him to go ahead so you will hear from them in Part 2 about what they are doing and what they are reporting.

It is truly independent, our job is to fund it and read the reports when they came in. We did that way deliberately and we did it based on feedback we had gotten from interveners and the general public in the past that they didn't really believe our numbers when it was internal Bruce Power stuff. Even though they might be good numbers, people question it. So we said, "Well, okay, we will do the independent research". In other areas where because of the nature of the industry and that where you really can't do the independent research -- but certainly in environment and fishery in these areas you can.

So that that work has been underway. We have been looking essentially, and I think probably why it is not really in the staff things is it's not actually a regulatory requirement. So we are not doing these things because we are required to do them. We are doing it looking forward to another 30 years of operation, recognizing that the lake is having some significant stress from other factors, temperatures are warming, lake levels are going down and if we want to be able to operate we need to better understand what the impacts of things are on the

fish population. So we are really just being, I guess, proactive and looking out.

We realized when we started doing the EA follow-up that people really didn't understand how lake whitefish for example really -- yes, we didn't understand the details of how they spawn and what affects their effectiveness after the spawning. Round whitefish was the answer grant, which is a follow-on to that. And none of this was, as I say, really -- really required. We started looking at thermal effects and a lot more detail because it is always an interesting challenge and what that means, and so those things are what we incorporated.

I could go into more detail, I do have a short presentation if you want, or we could leave it to Part 2 and let the researchers tell you. I am open to either, whatever works.

MEMBER MCEWAN: But there are no limits or constraints to publication?

MR. SAUNDERS: The only constraints we put in the contract is that it be peer-reviewed. So the publications have to go through the university peer review process and if they pass the process, then they are used, but it does create an interesting little challenge for us, right. CNSC staff for example like to see all the results as they come in. The researchers won't give you the

results until they publish it.

So we have had some interesting arguments about what that means and how that works, but I think the independent research is important unless it is a critical issue that you have to solve today. Then we left the researchers do their thing. The contract does require that all that data be made available to us, so even if they don't publish some of it the data will in the end be ours and we will be able to use it with CNSC and other places.

THE PRESIDENT: It is my understanding and I see some of staff here that were involved in some of the results together with Environment Canada and Fisheries and Oceans. Do you want to comment quickly on that?

MR. McALLISTER: Certainly. It's Edgar McAllister, the Acting Director for the Environmental Risk Assessment Division.

Before I tackle that one, Dr. Binder, Dr. McEwan, we do mention the research briefly, not in the body of the CMD, but in our EA Information Report. And CNSC is always room lying on the best science when providing our recommendations to you for decisions.

And, yes, Environment Canada and ourselves and other partners such as Fisheries and Oceans Canada are involved in reviewing the research as it comes out in these peer-reviewed publications. There is reference in the

documentation to some of the recent research that the CANDU Owners Group is doing so we have received those submissions and we are reviewing them as appropriate.

THE PRESIDENT: Dr. McEwan...?

MEMBER MCEWAN: Thank you. So my second question, again it is staff's CMD page 9, the safety and control table. I struggle to understand every time I see this type of a table.

In 2009 the operating performance of Bruce A and B was fully satisfactory. Since then it has been satisfactory. What does this mean? Is it a degradation? Does it suggest something is not done quite as well as it was before or is there an integrated component that explains that?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

So I think staff, again, we are trying to message across here, but unfortunately that is an integrated component where we actually moved something from that area, a reporting subject to another area and therefore it resulted in a rating change. I think staff have -- we have a methodology and a process that we -- to arrive at these ratings. It is based upon the number of findings, thousands and thousands of findings that are rated individually, aggregated. The aggregation goes into

bins, which is related to our safety and control areas. In 2009 to 2010 the change in the rating was due to the aggregation of a certain aspect, went from one bin to another. No safety significance.

MR. SAUNDERS: Yes, I perhaps can give you an example. Number 10 is a good example of that. So number 10 originally was emergency planning and in 2010 we added fire protection and fire response into emergency planning so it change the score slightly. It really broadened that area out very significantly, right? So a similar thing happened on all the licensees. When you make a change in the numbers it changes the output.

MR. LAFRENIÈRE: Ken Lafrenière.

It's a very busy table and, again, we apologize for that. We report these annually. You can see like going from 2009 to 2010 the safety and control areas have evolved slightly.

So therefore, for instance, on waste management we didn't report in 2009 and we started rating that area in 2010. It's not that we didn't look at that area. We took that area and separated it out to make it more clear.

MEMBER MCEWAN: So for the reader it might be helpful to put a little asterisk or something that you changed methodology and a little descriptor at the bottom

to actually let us understand that, because I went back to this several times and --

THE PRESIDENT: Okay.

Dr. Barriault...?

MEMBER BARRIAULT: Thank you. I am also happy to be back.

Just a few questions. First of all really on the industrial safety, I hate to say that, but I'm impressed, okay. But having said that really I am also very doubting. You know, obviously you have had some silver bullets really in 2004, 2008, 2009, 2013, zero. You know, it begs the question, I mean how do you do it?

So it would be fascinating to have a real close look at it in terms of the details of, you know, how you manage this. I spent a lot of time in industrial medicine and I will tell you that this would be the envy of all a lot of industries. How do you compare to the atomic industry in general in Canada and worldwide?

MR. HAWTHORNE: Duncan Hawthorne, for the record.

I can tell you what the master plan was because it was the first thing I did when I came to the Bruce site. We were obviously moving the plant from a public sector to the private sector and that's a change. What we were keen to do was find a uniting vision,

something that can represent what we stood for. We chose it to be industrial safety because it was actually a way of uniting everyone. Everybody wanted to go home safe and so it created a unifying vision between ourselves and all the trade unions.

We are a highly unionized employer and many people said that moving from the public sector to private sector would result in a reduction in safety focus; we would put commercial above safety. And so we wanted to very quickly demonstrate that wasn't the case. We formed an arrangement called "Target Zero". We signed a charter between myself, the President of the Power Workers Union, the President of the Society and we said we are going to do this together. We used the International safety rating system which I had used in the U.K. and the U.S. and put on a managed process to drive safety down. Many of those indicators are proactive such as accident event investigation, workplace reviews, all of those things to remove hazards from a workplace.

As we increased our -- and that was independently audited by DMV here, a specialist in this area. And so we were removing hazards from the workplace and dealing with that. You know, it had the effect we knew it would. As as our ISRS rating improved, our accident frequency declined.

In 2007 we brought in DuPont who are obviously a well-regarded safety group to have a look at our programs. You know, we were working through this with just, you know, with a passion together to get to target zero. We focused a lot on near misses. We focused a lot on those medically treated events because in so doing, if you deal with that part of the pyramid then you don't have lost-time injuries and fatalities and all those things which you will understand.

So it's a personal passion of mine and it's one -- as I said earlier, it is one of the top matters. That's why I can tell you what every one of those accidents were. If you asked me to explain every one of them I could without any notes. But the point is, if I know and people know it matters to me, then it matters to everyone and then you have got to just keep going after it.

MEMBER BARRIAULT: Thank you.

CNSC, obviously you have had the opportunity to look at those numbers, but having said that, have you questioned any of the numbers and looked at more detail as to how this was accomplished? And if indeed this is so, not that I'm doubting it, but having said that, really it would be sober second thought, so to speak.

MR. HOWDEN: Yes. Barclay Howden speaking. I'll be passing this to one of our site

inspectors in a moment.

But we do comparisons against other industries and we also look at the events as they occur to make sure the statistics are telling the whole story.

So I'd like Jeff Stevenson to describe the role that the site staff does in this area.

MEMBER BARRIAULT: Thank you.

MR. STEVENSON: Jeff Stevenson, CNSC staff site inspector at the Bruce site, for the record.

The performance metrics we get in industrial safety, we do review every quarter when they're provided to us, but that's only one picture in the whole regulatory oversight we have in industrial safety.

Me and my colleagues at the Bruce site, we're out there every day walking around in the plant and we do inspections on the various aspects of conventional safety: signage, housekeeping, PPE, what have you, and all of these findings all get rolled up together into the annual MPP report rating and it's based on all of this information that we've given the fully satisfactory rating.

MEMBER BARRIAULT: But do you look at

the statistics independently or do you just take the statistics as they're given to you?

MR. STEVENSON: No, being on site we do get notification that events have happened, so we are aware when these events take place and we can compare that to what were reported on a quarterly basis.

MEMBER BARRIAULT: Thank you. So, what you're saying really is, this is so.

MR. STEVENSON: Yes, that's correct.

MEMBER BARRIAULT: Thank you. The next question really, in the Bruce presentation you mention that you've gone from corrective maintenance to preventive maintenance and it begs the question really: your backlog in maintenance, is it preventive or corrective?

MR. HAWTHORNE: Since my chief nuclear officer hasn't spoken a word yet, I think I'll hand it over to him.

Thank you.

MR. CLEWETT: Thank you. Len Clewett, for the record.

Our focus is to perform our work on a preventive maintenance basis and industry time targets are 70, 80 percent of your work on performance. We

have had historically some backlogs higher than we like in corrective. We were very successful over the past few years to lower those into industry top quartile and now we're in a position where we are doing 70-80 percent of that preventive maintenance.

So, in summary, the corrective maintenance is in a very good state right now. We anticipate keeping it there and that's reflected on our forced loss rates. We've seen those historically at Bruce B with .6 percent last year at Bruce B and we also saw that in the last two quarters at Bruce A getting up to industry standards there and that's the key is really having that good equipment that you can rely on.

MEMBER BARRIAULT: Thank you. Just one --

THE PRESIDENT: Sorry.

MEMBER BARRIAULT: Oh, go ahead.

THE PRESIDENT: When you do your maintenance, do you -- I think I always have to ask this question nowadays -- how do you determine that all the equipment that you buy, purchase, replacement equipment is qualified and not fraudulent, that we never have to go through a Korean experience?

MR. CLEWETT: Regarding the OPEX in

Korea, even before that all the equipment is purchased under a technical specification. Anything that has a critical safety function associated with it is specified by the engineers and then through the quality program part of inspection when it gets here, you know, we validate that it is of acceptable quality.

We've also taken some actions with the industry, with the Korea OPEX to even strengthen those processes further.

THE PRESIDENT: You haven't found any non-compliant components?

MR. CLEWETT: That's correct.

THE PRESIDENT: Good to know. Thank you.

MEMBER BARRIAULT: Thank you.

Just the next one, it's just a brief question. On slide 32 with your pumpers, with your trucks, you relate to a dry hydrant. What is a dry hydrant, with no water in it?

MR. SAUNDERS: There's water there, but it's not pressurized. So the dry hydrant is a tool -- so each of those fire trucks, we have two different ways of hooking them up; one is down at the dock where you put in the suction yourself and draw it

out.

We want to provide a fast response capability as well, so at the end of each station there are hydrants that extend down into the outfall which is at lake level and it's basically a piece of pipe that extends down the outfall, but the top end looks like a normal fire hydrant.

So rather than having to drop down a suction into the outfall, we can just hook on the pipe and away we go. So it speeds the process up tremendously.

MEMBER BARRIAULT: And you don't have to re-align pressurized water coming in?

MR. SAUNDERS: No, we can use it, of course, but we've assumed for these things that we would be pumping it out of the lake directly with the trucks and that's what the dry hydrants support.

MEMBER BARRIAULT: Thank you.

Thank you, Mr. Chairman.

THE PRESIDENT: Thank you. Mr. Tolgyesi...?

MEMBER TOLGYESI: Merci, Monsieur Président.

Just briefly going back to this minimum shift complement, did I understand well that

staff is saying that this minimum staff complement should be revised because of this kind of unconformities, because when you are looking there were 56 -- 58 instances of non-conformity over a 21-month period which is about three times a month where the 16-hour requirement was non --violated, not just two, three hours, but 16 hour. So should we revise this minimum staff complement?

MR. LAFRENIÈRE: So Ken Lafrenière, for the record.

So the minimum shift complement is a number, it's a licence requirement in the existing Bruce Power licences and it details all positions theoretically necessary to handle an accident event. There's usually a lot more people on site at all times.

The hours of work violation occur as a separate issue. So the hours of work violation occur where there are critical staff, for instance authorized staff which are required for the minimum shift complement, Bruce Power might have to hold those staff overs and incur an hours of work violation to avoid a minimum shift complement violation.

So I think we'll have to look at how we reword these things. I can understand the

confusion, but the safety significance here is negligible. The minimum shift complement violations refer to non-safety significant individuals and, you know, stock keepers, people that are required that are not required immediately.

The hours of work violation refer to critical staff, control room operators, authorized operators that are held over to avoid minimum shift complement violations held over, for instance, the next crew cannot come in because of a winter storm event.

THE PRESIDENT: Okay. We have to especially say the "may". Explain.

MR. BOUCHARD: André Bouchard, Director, Human and Organizational Performance Division.

I'll try to shed clarity on that, making sure that we all understand what we're talking about.

If you look at the LCH on page 22-23, you will see what minimum shift complement really looks like, the descriptions of qualifications and number of individuals that are the minimum complement.

How do we come to that?

Minimum complement is to ensure that

there's sufficient number of qualified staff for normal operation as well as event response at the station. It's a combination of two things. That's very important.

Minimum shift complement is determined through a very thorough analysis of potential accident scenarios, worst case from a human perspective, a resource perspective and an analysis is done of all the emergency procedures to draw the qualifications and the number of individuals necessary to make sure that normal operation and events are responded.

So the first question is, should we revise minimum shift complement? At this stage, those numbers are very thorough and well supported by good analysis.

The link to minimum shift complement to hours of work is the fact that some people in the stations sometimes have either accidents while working or they're called to go back to their relatives because something happened at the house.

It's important to understand that at that time that the licensee has additional measures that they put in place if ever they become the low minimum complement for the period of which they are beyond until they bring somebody back at the plant.

So it is safe to operate the plant in the current condition until somebody comes back as a helper, but it's also important to understand that for normal operation that that person may just do administrative duty nature, but in case of an emergency that person could take the role of an emergency responder and this is where they're accounted, minimum complement.

So at that level we make sure that the licensee kick up its procedures to make sure that while the low minimum complement safety is maintained.

MEMBER TOLGYESI: Merci. I'm just going back to one radiation dose to the public on page 64 of CMD of staff.

You know, there we are talking about maximum effective dose to the member of the public 2013, 1.3 mSv, where our regulatory limit is 1,000 mSv[sic] and natural background is 2,300 mSv[sic]. So --

FEMALE SPEAKER: Microsieverts.

MEMBER TOLGYESI: Microsieverts, I'm sorry. So how the general public should consider and understand these values not to be confused because, you know, your performance is 1.3, naturally it's 2,300, and the limit is a thousand?

MR. BOUCHARD: Micro.

FEMALE SPEAKER: Micro.

MEMBER TOLGYESI: Micro, yeah.

THE PRESIDENT: One is millisievert and the other one is micro.

FEMALE SPEAKER: No, it's not.

MEMBER TOLGYESI: No, no, no, no, no, no, no. Yeah, all is micro.

THE PRESIDENT: We have always used the 1 mSv.

MEMBER TOLGYESI: M'hmm.

THE PRESIDENT: Okay. So if we convert all this to millisieverts that would be lots of zeroes.

MEMBER TOLGYESI: Yeah.

MR. SAUNDERS: Frank Saunders. Yeah, I mean it's something that we've always said that the actual releases from the plant are extremely low. In fact, the actual releases are right at the edge of detectability in reality in terms of instrumentation.

It is low. You get a lot more radiation day to day. In fact, most people that fly from Vancouver to here a couple of times a year get more dose than most of our actual radiation workers in the plant do. It's a natural part of life that there's always a great confusion about nuclear plants

as a source of radiation. In reality, we're very, very low. We don't contribute significantly to the environment at all and the workers on-site don't get a lot of dose compared to many other people that you wouldn't even consider to be a radiation worker.

So it's unfortunate. We try to explain it in our slide. We show that chart with the little small corner, what we're really trying to show to people that it really is a very insignificant amount that they see.

THE PRESIDENT: Okay. Start second round. Dr. McDill...?

MEMBER McDILL: Thank you. I'm going to sacrifice a question to go back to something Mr. Hawthorne said.

I did not actually confuse the two over estimates. So what I would like --

MR. HAWTHORNE: I apologize, for the record.

MEMBER McDILL: I wanted to point out from the perspective of an intervener, in paragraph 2 under Impact of Aging within one sentence it refers to conservative over estimate and the impact of aging on safety margins for large LOCA. Then in Section 3 it refers again to over estimates and large LOCA.

I understand they're different, your interveners will not; both of them refer to this document and the referencing is a fail. Sorry, I had to say that.

MR. HAWTHORNE: And I think since you asked me, or mentioned my name I'd say, I didn't write any of that. You know that, eh?

--- Laughter / Rires

MEMBER MCDILL: I know you didn't. I should say, this is staff's document so you don't actually have to defend it, but I think --

MR. HAWTHORNE: Thanks a lot.

MEMBER MCDILL: -- from the perspective of an intervener this is really confusing stuff -- really confusing, stuff.

MR. HOWDEN: Barclay Howden speaking. We agree with you. Again, it comes down to the level of information to provide in this document, enough to give some transparency, but not so much that you have a huge document, but by doing that you get the confusion, especially when we're going from section to section and people are reading it more holistically. No, understood, one hundred per cent.

MEMBER MCDILL: I understand fully the challenge of writing a 60-page document or so, maybe

it's 80, and trying to convey an enormous amount of information. It was just to point out that both of them referred to 46 and 46 has got problems.

Back to the question. So I sacrificed a question, now I'll go back to my second one.

On page 25 of Bruce's slide deck, which I think is a very good top-down deck, there's a picture about pick-up at the roll joint, but it doesn't say pick-up of what at the roll joint and I assume it's hydrogen. Yes, that's on the next slide.

MR. NEWMAN: Yeah. For the record, Gary Newman. You're absolutely correct, it's actually deuterium.

MEMBER McDILL: But again, this is going to be for Day 2, your public is looking at this and it's not clear what's being picked up, you know, it could be hair in the drain, I mean, whatever.

THE PRESIDENT: So that's an opportunity for me to piggyback on that question.

So I'm trying to understand the 125 ppm. Is that the new kind of determination of the shelf life? You guys have been talking now, you can go to 150 with 300,000.

So I'm trying to understand, is that now the gold star standard for determining shelf life?

I'm using loose language here, right.

MR. NEWMAN: Gary Newman, for the record.

We have an ever changing maximum there because as we dope the pre-irradiated material and do our burst testing we're constantly increasing as well as filling out the entire envelope. So we'll still be doing testing at 30 ppm, 60, 90, but we also want to go on the high end because that builds margin and part of what we do is manage margin.

So you're correct, but it does loosely correspond with the number of effective full power hours, so you're correct.

THE PRESIDENT: So I assume that this is sort of new because you haven't had those pressure tubes running for so long. So as you get closer and closer, is the intention here to see how far you can go beyond the 125 ppm?

MR. NEWMAN: Gary Newman, for the record.

The intent is to operate the units until the target life, whatever the business decides that should be, my job in all of that is to make sure that I give them margin outside of whatever that target life is, so I build in additional reliability

to where they think they need to operate.

So if that happens to be 300,000, which we are considering, then I'll have to test beyond that. So we've tested to about 124 now, I'll have to add probably about another 25 ppm to the material and then burst test those specimens as well.

THE PRESIDENT: So staff, how comfortable are you with this as a good measure of safety, that the thing will not fracture, will not burst, et cetera, et cetera? And what's the sensitivity of this measure?

MR. HOWDEN: Barclay Howden speaking. I'll be sending this back to John Jin and Glen McDougall from Operational Engineering Assessment Division.

I just want to scope that the work that's being done, this is an industry project which is being done I think with Bruce Power, OPG and Canadian Nuclear Laboratories all in, and so with your specific question in terms of our comfort level on the sensitivities, I'll ask the gentlemen at the back to comment.

MR. JIN: For the record, my name is John Jin. I'm the Director of the Operational Engineering Assessment Division. My division is

responsible for the technical review of the submission related to the pressure tube fitness for service of our generator.

Regarding the hydrogen content of the pressure tube, the hydrogen content is a major part for the structure integrity of the pressure tube, so last several years industry conducted quite comprehensive research project to confirm the fitness for service of the pressure tube going beyond the normal shelf life.

And one of the four research for this is doing the burst testing to validate the engineering methodology operator model.

So industry did around 15 burst testing with the actual pressure tube, but the issue is that the pressure tube at the end of life, we need to have higher hydrogen. So industry did the artificial hydrating the pressure tube and staff reviewed the condition assessment of the pressure tube supported by testing with the 124 ppm. So we still have high level of confidence of the pressure tube until 124 ppm.

Going beyond, we are not in a position to comment on that, but if industry do more testing and submit it, staff will be reviewing that, we will

be in a position to comment on that.

And regarding the EFPH, so the pressure tube fitness for service was assessed based on the hydrogen content which is 124 ppm. The issue is, when the pressure tube will reach that point, it is kind of an approximation, it could be one or 245 or could be 247. So that's the reason there is a little bit difference in 2,000 hour. So that's the current status of the pressure tube.

THE PRESIDENT: Dr. McDill...?

MR. HOWDEN: Dr. Binder, may I just also ask, that we're talking about the R&D, but as part of this whole management of pressure tube's fitness for service there's in-service inspections and all sorts of other things that go on as well, R&D is one component of it.

THE PRESIDENT: Dr. McDill...?

MEMBER MCDILL: Go ahead and ask your questions. I can come back later.

THE PRESIDENT: Okay. Ms Velshi...?

MEMBER VELSHI: Thank you, Mr. President.

I'm going to tackle the Probabilistic Safety Assessment, a series of sub-questions. I hope, Mr. President, you'll allow me to have -- it could be

one Omni-question, okay.

--- Laughter / Rires

MEMBER VELSHI: So, I'll start off with staff. On page 32 of your CMD, more for clarification, we talk about the Level 1 assessments done. High wind was one of them done, it's just not mentioned here and I just wondered, but is that just an oversight?

Do you see that under Probabilistic Safety Analysis Level 1?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

I'm referring to page 32 and the Level 1 at-power includes high wind/tornado. That's second to last, external hazard and the first bullet, so basically:

"Level 1 at-power: internal events, common cause failures, data, accident sequence quantification, internal flood, internal fire, seismic, consequential fire and flood, external hazard, high wind/tornado, external flood phase 1."

MEMBER VELSHI: Thank you. So question for Bruce Power then. When you do the risk aggregation, I mean you talk about whole site that you're going to do it. Is that combining A and B, or is it a station aggregation level?

MR. HOWDEN: Frank Saunders, for the record. On the Bruce site, Bruce A and Bruce B are at the closest point three kilometres apart, so we have treated them as two separate stations at this point in time.

We've aggregated for each station, we haven't aggregated for the whole site. We are trying working with the industry to build a risk model that looks at the whole site, you know, and you have to consider a number of possibilities.

So, for example, we run models on tornadoes on the site and a tornado like Goderich, if it impacted Bruce B wouldn't significantly impact Bruce A. So you have to account for that if you're going to try to do a whole site, you can't assume that everything is impacted by everything.

And there are, of course, some things, like a seismic event, which would impact everything. So it's not as simple as it sounds to just create a whole site number.

But I think the important message when you look at either the individual units or you look at the station aggregations is that these are very, very small numbers.

I think the other important thing to look at is if you look at the Level 1 plant PRAs, for example, adding that's extra level of protection through the mobile equipment has actually improved those numbers by a factor of 10 in most cases and by a factor of much greater than 10 in some areas.

So in reality, adding the EME has not only helped to protect against external events, it's really improved the safety dramatically even on internal plant events.

So I think the message to take away is that what's happened post-Fukushima has been a very significant improvement in the overall risk models for the site.

MEMBER VELSHI: And I think you know, having been at previous licence hearings, there's a lot of interest in this and a lot of time spent in that, and I'm sure we will in Day 2 spend a lot of time.

And so I think clarity on aggregation, are we really talking about site, are we talking about

station aggregation and the Licence Condition Handbook perhaps, at least to me, wasn't quite clear, what is it that the expectation should be and what's the timeline or at least the estimated timeline for that would be good.

The second part is -- and, Mr. Saunders, you've touched on that -- is the level of detail that's made available or disclosed.

Appendix A does not talk about what it was prior to the EME being taken into consideration and the impact of that. And I know for the other licensee all that was shared and it was extremely helpful in conveying exactly what you have just done verbally.

So it is also the level of detail that one discloses. And are you planning on sharing more on your website other than this summary?

MR. SAUNDERS: In our view, the summary tells you the story, the calculation we did. If we get requests, we will certainly share more. There is a point where I can share so much that it is meaningless to you. So we are trying to actually provide a clear concise document that people

We can certainly add some comparison between what changed and what that meant. I am not

intending though to start putting hundreds of pages on the website. I don't think it adds to public clarity in fact. But we will respond to requests we have for sure.

But we can certainly show the change with EME, in fact I have a couple of slides that show that. If that is desirable, we can do that.

MEMBER VELSHI: Yes, it was particularly the EME. And maybe staff can help you in determining what additional detail based on the kind of interest that was expressed. Certainly when we were doing the Pickering hearings --

THE PRESIDENT: And may I just add? I am also with Ms Velshi, I think you don't need hundreds of pages to explain a bit better, you know, we forgot about the difference between limit and target.

Some of the targets are being exceeded, so what, it is not under the limit, but it is over the target. You know, we made a lot of -- that if it is between target and limit, you take some action.

The role of the EME, I mean by event, you know, for fire, for wind, et cetera, it is not explained by putting all those "diesel". And even

having an MOU amongst all of you to support each other, how does that credit it in the probabilistic safety analysis?

Because the real number that everybody is worried about is the release outside the facility. And those are the numbers that we need to explain better, not only for each unit, but for the whole site.

MR. SAUNDERS: Yes. I mean, we certainly tied to explain it. And we certainly explained the limit or the objective and the limit approach, right? But we will take another look at it and see if we can clarify it. We don't actually factor in the support from other stations, because we wouldn't actually know how to model that at this point in time.

The tool here is a little bit imperfect when you get into these things. PSA or PRA, whatever you want to call it, is a very rigid mathematically formulated tool, it is designed to look at safety systems and reliability of systems.

You start trying to apply it to something like, you know, would OPG get something up in time to help us? It becomes very difficult to do it and have somebody say, yes, that is a valid PSA

number. But what we are trying to look at is really more about some kind of a risk model that helps to identify those things, right?

And it is the same with the single site type of approach, you have a bigger site, a lot more equipment, a lot more people to respond. There is a plus in that. It is really hard to figure out how to put the plus in the number.

So one of the things that we have worked hard to do is to build a simulation model where we can actually simulate using Monte Carlo and other techniques, the effectiveness of our emergency response. So we got that model last fall and we are this year evaluating it.

So as far as I know we are the first nuclear industry to have a model that will actually estimate the effectiveness of people response and emergency mitigating equipment response to an event. We still have another year or so of work to turn that validation into something that we can claim as a regulatory tool.

But that is our attempt to reach at this people part of the problem, right, the people give you a very flexible response, they respond very well to unusual or unexpected circumstances versus

equipment, and that is a plus. But the PRA methodology, kind of poor for dealing with it. So we are developing a different tool which we think will paint the picture and allow people to see what it looks like. It needs a little bit more time before we are fully there.

THE PRESIDENT: Look, I understand, I have heard many times about the complexity of the tool, but it doesn't -- we know intuitively that some of those mitigations will deal with let's say blackouts. Just because you cannot quantify it doesn't mean that somewhere along the line -- there's got to be an explanation that that will reduce the probability.

And I still believe you should be able to do an estimate -- not necessarily precise -- by how much. And again, Dr. McDill, I understand you wanted to add to this?

Oh, sorry.

Okay, Ms Velshi, sorry.

MEMBER VELSHI: So getting to follow-up to the President's comment around the target and the limit and the expectation is that if you have exceeded the target and if you are under the limit, you still need to come up with how are you going to

reduce that. And there is no discussion on that.

In fact for Bruce A units, even if it is just a rough aggregation, you are very close to the target there. So I think the discussion on additional improvement initiatives that you are pursuing I think would be very helpful, because I can guarantee that there would be a lot of discussion on that on day 2.

So tied in with that, again on page 71 in your last paragraph where you talk about the values reflect committed enhancements. So does that mean these are enhancements that have not been completed and are on the books? It is the last paragraph on page 71.

MR. SAUNDERS: Yes, in essence, those are the items that are in the Fukushima action plan. And most have been implemented, but there are still some to go. So we factored that into the discussion because we really wanted to see where the world was going.

However the stuff that we have in there makes the -- already there is the majority of it, the remaining stuff is a relatively small component. But we did factor in, because it was part of the planning, about what you should change and what you shouldn't.

THE PRESIDENT: I know that staff is sitting and ready to comment on the PSA. Is there anything you want to add to this discussion?

MR. HOWDEN: Dr. Binder, can I comment before you push it back?

I think in terms of this, page 71 of the Bruce CMD is actually a good reflection of where PRA can be a very valuable methodology for safety analysis because it helps you identify I would say dominant contributors to accident scenarios. So you can actually focus where you may want to do design upgrades, program upgrades. It also allows the licensee to focus their inspection efforts as well as ours.

So I just want to put that in context. We shouldn't forget that as part of safety analysis there is a deterministic safety analysis as well, which basically makes some very broad assumptions that something is going to break, regardless of what caused it, it is going to break. And what are the mitigation measures that are considered and what are the consequences?

And this feeds in at the early days to the design of a plant and in the later days to improvements to the plant that is since then

complimented by the PRA work.

So I think that is the way we are really looking at it in terms of Bruce Power is been saying about continuous improvement and we are very supportive of this and this is a tool that they can use to do that.

I will ask our folks at the back if they have any further comments.

MS AKL: Yolande Akl, Director of Probabilistic Safety Assessment and Reliability Division.

Actually, I don't have much to add to what Mr. Howden said other than just maybe to clarify what the targets are for the licensees. From our view the targets are like administrative goals to ensure that there is continuous improvement as much as possible.

And CNSC expects that the licensee meet these targets and propose design or operational changes to meet them. So we expect them to come back to us with some improvement opportunities learned from the PSC to get closer to the targets.

But Bruce Power meets their safety limits and have met them, and there is no additional risk we believe to the health and safety of the

individuals at Bruce Power and the public.

MR. FRAPPIER: If I could add as well. Gerry Frappier, Director General of Assessment and Analysis.

Just to make sure people have appropriate expectations of where PSA can take them to as far as an analytical tool.

So PSA is a very very important tool and it is an excellent tool for highlighting areas for improved safety from an equipment perspective.

I think, as Mr. Saunders said, we have to be careful when we start trying to make a fairly rigid mathematical approach to reliability and the sort of failures we can have, and try to apply some of these very broad organizational improvements such as OPG helping out Bruce in this case or something.

So that is going to be a very big challenge if we want to maintain the ability to handle things in a very rigid mathematical way, which is very beneficial when we are looking at actual equipment.

The second thing I wanted to mention is the status that the world is at right now with respect to probabilistic safety assessments in an aggregated situation. So the PSA, as a tool, was always designed to look at a unit.

We are now sort of pushing the envelope and I think everybody around the world is certainly very much watching because this Commission is definitely pushing us into areas that PSA perhaps wasn't expected to go when we start talking about aggregation across different hazards, but in particular aggregation across a site.

So that is a program of development work that we have ongoing that we are on board to come back to the Commission and talk about. And also industry is looking at a lot with respect to improving methodologies to get there. But there is a little bit more work left to be done before we can be fully solid on that the same way that we are solid on the PSA per unit.

THE PRESIDENT: Well, okay. Let me react to this, okay?

We as the Commission and the public, we are not interested in the mathematical model. We don't know about the mathematical model. I wouldn't recognize it if it walked into the room here. I understand it is complicated.

What we are concerned -- you setup goals, you set numerical targets, you setup limits, and then if you don't meet it, we ask the question, if

those are not the right tools, come up with different tools that explain the safety case.

So it is your own creation that is causing the problem here. So if everything was done on one unit and you don't have an answer for the full site, then it is a problem. If you need a new tool for the whole site, so be it.

So we are just reacting to what you put in front of us. That is just to make sure it is clear here.

MR. JAMMAL: Ramzi Jammal, for the record.

I accept everything that was said. There is just one thing. I would like to close the loop with respect to conformity with our requirements.

As we speak today, any, the enhancement that we are going towards is not impeding, that the applicant is in compliance with the requirements that currently exist in front of us. And that is the key point here.

Yes you are correct, Mr. President, that the licensee will set the goals and we will hold them responsible to meet those goals and not exceed them. And the target is the administrative level that they must achieve as an ongoing enhancement.

But I want to close this discussion, it is all very well to look at the future, but we are before you with current existing requirements that we held the applicant against, to meet them, hence that the compliance with S-294 and the existing requirements are not in question. We are just looking for the future and ongoing enhancement.

THE PRESIDENT: Thank you.

MEMBER VELSHI: There is an existing requirement that if your assessment is between target and limit, then you submit improvement plans, design or operational.

It was no evident in here that that submission had taken place, that staff had reviewed and said, this is acceptable. So I think that was the nature of the question. How do we know that that requirement is being met?

MR. SAUNDERS: Frank Saunders, for the record.

I will say something that may not be particularly... There is actually no rule that says we need to be in between these. These are self-appointed rules. They are design tools, right?

So these things come into the licensing process as part of the reactor design that

you have to have approved and we use them as design tools during normal operation, and we do that to make sure we maintain our design and to implement improvements. There is really no regulatory requirement for us to go from one to the other. We do that because it makes sense for us to do that.

We have listed -- in fact, when we made our submission it does list the things that we are going to do to improve this, it is already in the submission, and they get reviewed. And of course, you know, we will go through that and provide the reports as they go.

We are working, like I say, a model that I think is much more communicative, allows us to factor in people and other resources. And that model I think will be quite helpful in this discussion, more so than PSA. Because the issue with PSA and, you know, we can argue about exactly the number, but $2 \times$ nearly 0 is still nearly 0, quite frankly.

And I can with modelling -- like, none of these numbers include outside of our class 1 systems. We assume all the other systems fail because it costs a lot of money to model all those systems. I can spend a whole pile of money, millions of dollars, model all those systems and I will make these numbers

a whole lot better. But it won't improve safety at all, right?

So we try to cut the balance between where it is worth spending the money and where we are just doing it to get the number, right?

And the PSA gives you a lot of insight where what systems are important and which ones it is worth spending money to improve. And that is what we use it for and we do that quite diligently.

And, you know, when you are looking especially at unique situations, different shutdowns and component replacements, this is a very good tool and it is very helpful in making sure that you: a) stay within your limits; and, b) do better if you can. But it is not an absolute operating requirement in that sense. It is not built into our licence in that way.

THE PRESIDENT: Dr. McDill?

MEMBER McDILL: Thank you. This is just a follow-on. Since everyone was on page 71, I wanted to talk about page 72 which is right next door.

Actually I saw Appendix A, and it is separately posted on the website, Bruce's website, actually nice high-level document, and I think most interveners could read them quite well.

So it talks a little bit about when you can and can count things multiply. And so I found the document itself very good.

But just two comments that can maybe be cleared up for day 2, and that is on page 72, "Specifically these enhancements are..." And one of them that -- the first one, emergency mitigating equipment, I think that is quite clear.

The second was to enable automatic isolation of the shield tank on containment. And that part is fine. And then containment button-up. And I think your average intervener won't have the foggiest what button-up is.

And then the next one, enhancements to improve robustness of containment to multiunit events. That is fine.

And then the next one is improvements to group 2 reliability. And I must confess, I didn't do a control F and search for group 2, but I'm pretty sure that if there is a reference to group 2 there is only one, I can't be certain.

And I think for day 2 it would be nice for the interveners to know what group 2 is. The others are fine. So that was just my comment on that particular page. Otherwise, I think the document is

quite a good high-level document. The flowcharts are wonderful.

MR. SAUNDERS: Fair comment. I will clarify that just to satisfy you on the station. You know, station, vacuums, you know, the containment system is maintained under vacuum, right?

So there are pumps and filters that are working all the time. If you get into an event all those entries out of containment are closed, and so that is button-up. So all those systems go offline, those containments close and containment becomes a hard structure essentially. That is what it refers to.

But I agree, that we have a tendency to use the jargon and sometimes not think about what people think.

THE PRESIDENT: Okay. Monsieur Harvey?

MEMBER HARVEY: Merci, Monsieur le Président.

Page 53 of the staff document, 53. It is just about the containment, concrete structure. At the end of the paragraph, "During the current licensing period, CNSC staff did not identify any significant compliance issues affecting safety in this

area."

But how can the staff identify -- what kind of problems could be identified by the staff or...? It is only coming from Bruce. And I would like to hear Bruce, about what is done about containment structure on a continuous basis.

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

I will give the high-level answer and then I will turn it over to John Jin to specifically talk about the containment structure.

So the containment is a special safety system. Staff routinely review every aspect of the performance of any special safety system, including containment.

So we look at quarterly containment button-up tests as an example that are done to assure that they keep -- all those valves and various barriers in containment can close when asked to do.

We look at the instrumentation system that signals when a containment button-up is required, pressure changes, et cetera, to make sure that it will button up at the appropriate limits set in the Standard.

We look at the periodic inspection

program where they go and look and visually inspect or do various non-destructive examinations of containment structures, components, concrete.

We look at the leak test results over the trending of the station history, so we have leak tests basically done on a quarterly basis and we look at how that is performing.

So all this is reported to the CNSC and basically we, as part of our oversight program, look at that.

I will ask John Jin to get into the real details of what they do.

MEMBER HARVEY: I will turn to Bruce just to ask what are you doing or what on a continuous basis are you doing with that -- mainly with the concrete structure?

MR. NEWMAN: Gary Newman, for the record.

Containment structure is comprised of a number of different pieces, as already alluded to. It would be like concrete, but there would also be bellows on steam generators and PHT pump and so forth. So that, in totality, is really your containment structure as examples of that.

So we will do inspections on these

various -- so they will have inspection and condition assessments just like any other piece of the plant we inspect. And if we find any abnormalities, they are repaired or replaced.

And I believe we actually now have a lifecycle plan that is either finished or nearing completion on the containment structure because we want to manage it just like we do our other major components. So just like we manage fuel channels and steam generators, we are applying that same level of rigour to the containment structure.

They have always had system health reports. As already noted, we do quarterly leak rate tests to make sure that we are still maintaining the integrity of that. And in fact, we will do a lot of inspections when we go into our vacuum building outage this spring at Bruce B and we will be able to be quite a bit more intrusive.

MR. SAUNDERS: I should just mention too there is a lot of online testing as well. All safety systems have a bunch of what we call safety system tests. And containment is no different, so these box-up valves we talked about, they get tested, the initiating events get tested. We can measure the leak rate ongoing because, as I say, we maintain at

negative pressure so we know how much air we have to take out of the building to maintain it negative. So we know those leak rates, we know those measures and we chart them.

So there is a continuous scope of everything from safety system tests and leak rate measurements to much more sophisticated testing, which we will do during the outage this spring.

And things like, you know, anytime you have a penetration through containment as Mr. Newman mentioned on the bellows or anything like that, there are inspection techniques we can use even while operating to assess that those things are good.

So there is a whole range of tests that would fill a couple of books here to show them to you.

MEMBER HARVEY: And if there are problems, is that you have the obligation to report to the staff?

MR. SAUNDERS: Actually, it is more than that. All these safety systems actually are in our OP&Ps, they require us to take certain actions. We have a book called the impairments manual. So anytime a safety system, whether it is containment or something else, is impaired at any level, there is

actually a prescribed action that we much take from, you know, fix it to shutdown, and all of them require us to inform CNSC staff that we have the issue.

MR. LAFRENIÈRE: Member Harvey, I would like to add that they report this regardless of problems. It is a continuous reporting. In addition, if there are problems, we get specific reports focusing on the issue.

So these are routine compliance reports even though the systems are operating normally.

MEMBER HARVEY: Okay.

On page 55, you do have a special problem with Unit 8 steam generators where you have accelerated corrosion. Could that problem interfere with the hope of going to 245 hours?

MR. NEWMAN: Gary Newman for the record.

A very good question. So we look at all components and then probably focus in on the most limiting one. That typically is the pressure tubes but there are special cases.

We have the Unit 8 case where we have a subset of steam generators. There's three of them in particular. When they were originally fabricated, it came from a batch of material that was low in chromium, a little

bit lower than the others, and so they have a slightly higher flow accelerated corrosion behaviour.

But we've put additional supports in and we've also gone to the OEM, B&W in this case, and had them do an end-of-life evaluation to confirm that they're comfortable with where we're targeting. And of course we inspect these boilers at every outage. So we feel very confident that that will not be -- the 247 or 250 is nowhere close to where these boilers will last.

MEMBER HARVEY: Thank you.

THE PRESIDENT: So that's a good time to ask. So Unit 5 -- if I look at your chart, Unit 5 is destined to reach the limit in 2019. What happens if you reach this limit without yet -- during the licence and without any refurbishment plans? What will you do, you're going to stop?

MR. SAUNDERS: Yeah. I mean we clearly have a regulatory limit on it, right? So I mean --

THE PRESIDENT: I just want to hear you say it.

MR. SAUNDERS: Yeah. No, so we --
--- Laughter

MR. HAWTHORNE: So let me just say a regulatory limit is a regulatory limit unless we move it. So the answer is obvious. The plant won't be open beyond

the regulatory limit unless we make a case for it to do so.

THE PRESIDENT: Okay. So everybody's understanding right now is, as stated, it is kind of a holdpoint regulatory limit. Okay, thank you.

MR. HAWTHORNE: For the record, Duncan Hawthorne.

Gary did say that we're doing these tests and we're expecting to have results by the end of 2016. So well in advance of that, we will have information that would allow us to propose some changes to that. So until we've made the case -- we haven't made the case but we do have plans to provide additional supporting information to operate beyond 247,000.

THE PRESIDENT: Do you want to add something to this?

MEMBER BARRIAULT: (Off microphone).

THE PRESIDENT: I'm sorry? Go ahead. Go ahead.

MEMBER BARRIAULT: Thank you.

On slide 28 you refer to leak-before-break and I've got a lot of problems with that. The problem I have is that to me a break is a big leak and what's the definition of a break and what's the definition of a leak? Because if it's confusing to me, I can imagine it would be confusing to other people too.

MR. NEWMAN: Gary Newman for the record.

So the leak-before-break requirement is one of the defences-in-depth. So the actual primary, if you life, fitness-for-service requirement is that we never allow the pressure tube to get to a place where it leaks or breaks.

A leak is a controlled circumstance that we simulate and we have detection systems. For example, in our annulus gas system we monitor dew point and if in fact we see a change above an acceptable level, that's an indication to the operator to take action and within a certain timeframe bring the unit down to zero power hot and then proceed to cool down and depressurization. That is all part -- when we say leak-before-break, that is the entire sequence of events from operation all the way down to cold and depressurized.

MEMBER BARRIAULT: That begs the question: How much time do you have before a leak becomes a break?

MR. NEWMAN: Well, that kind of depends on the specific circumstances but you normally have like hours for the operator to react and bring the unit down. So we evaluate that. We roll that into their -- not only into their manuals but also into their training.

MEMBER BARRIAULT: Are you confident really that you have that time all the time, that you

always have an hour or so between the leak and the break?

MR. NEWMAN: Gary Newman for the record.

Yes, we are very confident that we have adequate time for the operator to take action.

MEMBER BARRIAULT: Do you support that?

MR. HOWDEN: Barclay Howden speaking.

I think what they've said is very accurate. Now, this is supported again by the research program in terms of the fitness-for-service of the pressure tubes. The periodic inspection program, again, gives you what's actually going on. The detection system was built into the Candus exactly for this and we're satisfied that Bruce Power has the processes to respond when they get some sort of indication that it may be leaking.

MEMBER BARRIAULT: Okay. Thank you.

Thank you, Mr. Chairman.

THE PRESIDENT: Okay. I think we'll take one more before break here. Dr. McEwan.

MEMBER MCEWAN: Thank you, Mr. Chairman.

The potassium iodide, there is a discrepancy between the CMD from Bruce and the CMD from staff. Staff say it will be given to institutions. In your presentation and in your CMD, you say that it's given to everybody.

MR. HOWDEN: Barclay Howden speaking.

Ours was incorrect. It's for everyone.

MEMBER MCEWAN: Yeah. So just in terms of the potassium iodide, I mean I would like to see your tamperproof kit, but do you have some sort of web-based program in place that if little Johnny eats the whole family's kits or the dog has eaten my tablets on how the family should react and what they should do?

MR. SAUNDERS: What we've provided on here are numbers for people to call if there's issues, right? There's no sort of immediate medical consequences, as you know.

And we've done a couple of things but primarily it will be about an education program. So when we hand these out, we won't just sort of drop them on your doorstep. There will be an education program to tell people.

On here it does tell you who to contact, primarily the Medical Officer of Health or a hospital if you've got any questions, you don't know anything.

We've also, in conjunction with the communities, set up an emergency website which allows you to look at emergency response in general, and including nuclear, and will have more information about KI pills and how they work and that on it as we go forward.

So several sources of information but

fundamentally, you know, it says don't take them unless you're advised to take them by the Medical Officer of Health and you call if you want more information. And the education program is really probably as best we can do in that regard.

MR. HAWTHORNE: Excuse me. For the record, Duncan Hawthorne.

I'll just explain that the reason there's a difference between the staff and ourselves is not one being right and one being wrong, it's the passage of time.

As we said, it's very important that we think about how to do this. We have talked to our municipalities about perhaps, you know, having libraries or public places because we do have cottagers in the area too and so there's a question about, you know, if there's no one at home, how do they get theirs.

And so I still consider that to be an ongoing work in progress here. As we try and find the right mechanism, I mentioned before it's a delicate balance and so I don't think one's right and one's wrong. I think it's just the thinking is evolving as we go through this.

MEMBER MCEWAN: I think it would be helpful to have just a little more information about it in this, again, for Part 2, because I think people will come to this and it will be -- there will be questions.

MR. HAWTHORNE: Yeah. For the record, our intention here is by the time we get to Part 2 these tablets will have already gone out, so we'll be able to explain a bit how it was managed as opposed to how we think about doing it.

MEMBER MCEWAN: So my second question, Mr. President.

You showed the video of your remote sensors. They looked extremely sensitive based on your bowl of bananas. How do you set cut-off levels for action, how do you do QA/QC on them, and how do you ensure yourself that the readings are actually consistently accurate?

MR. SAUNDERS: Yeah. So the levels are actually set within the computer program and so that they will alarm if they exceed a certain level, right, and that alarm sends an indication to us.

There's a considerable QA program around both the design and the insulation of these, as there would be in anything in a nuclear plant. And there's a calibration and testing program that goes on now that they're installed and we'll confirm that they're actually reading -- through test sources and other things that they're actually reading the proper values.

They also have a self-diagnostic program. So the other kind of alarms we get: if the battery power

gets low for some reason, we get an alarm; if the unit stops talking back to the host, we get an alarm. So there's various alarms that also tell us that something is not right on the system and we can go and check.

But just like anything else, there's a calibration and testing program that actually confirms that they're reading the right values.

MEMBER MCEWAN: How often is that done?

MR. SAUNDERS: I'll have to check on that one for you. It's relatively new. I don't know the frequency off the top of my head. We just installed these last fall, as you know, so I'm not entirely sure on the frequency on that one. So I'll have to check for you.

MR. HAWTHORNE: For the record, Duncan Hawthorne.

We should also point out that the placement of these detectors is such that we're looking for a trend. You know, so having a spurious reading on one doesn't necessarily prompt a reaction. It's more about the distribution of them has been chosen to reflect the flow of air and other environmental impacts should we have an event.

THE PRESIDENT: I think we missed an opportunity to engage the Office of the Fire Marshal about the KI. I know they've been listening to us.

Mr. Kontra, are you still with us?

MR. KONTRA: If I can find my mike button, I am, yes.

--- Laughter

THE PRESIDENT: So the question is we've been shown a mock-up for the kit that's going to go to households. I assume you've seen it and are you happy with what is being proposed?

MR. KONTRA: To begin with, Dr. Binder, I'm happy with the whole work of the KI Distribution Task Group which we formed after your direction through the REGDOC and we are working with all facility operators and communities affected in having the KI business sorted throughout the province.

Particularly, Bruce has just indicated it is looking to have it done way ahead of your deadline so that they can have it in place for Phase 2 of these hearings. And yes, we are working together and we are satisfied with what they are doing.

THE PRESIDENT: Anybody want to follow up on this?

Okay. So, for Part 2 of the hearing, I guess we'll hear about major progress being made everywhere on this.

I think we need to break for lunch even

though we have lots of material we didn't even touch. There's some of the environmental assessment issues. We have our friends from Environment Canada and Fisheries and Oceans. Hopefully, you're still joining us because we want to know all about whitefish and some of the work that was done on that.

But nevertheless, we need to break now for lunch and I will try to -- why don't we try to get everybody here at a quarter to two. Would that be a problem for you? You want two o'clock?

MR. HAWTHORNE: Service is slow in the local places, so two would be great.

THE PRESIDENT: Okay, two o'clock.

--- Upon recessing at 1:01 p.m. /

Suspension à 13 h 01

--- Upon resuming at 2:04 p.m.

Reprise à 14 h 04

THE PRESIDENT: Okay, we are back and eager to continue.

Next in the line of speakers is Dr. Barriault.

MEMBER BARRIAULT: Thank you, Mr. Chairman.

This is for Bruce Power. On slide 14, your distribution of -- I guess employees are younger now than what they were in years gone by, from what I understand. Have you lost a lot of expertise and are you finding it more difficult with the new "generation" in the work at the reactors?

MR. HAWTHORNE: Duncan Hawthorne for the record.

I think we saw this transition both as an opportunity and a risk. Obviously, you know, we've kind of participated as an industry in rebuilding a nuclear engineering program. So we have arrangements with the universities to have good nuclear engineering graduates come through. We also bring them in as development students over the summer, so when they're first year, second year, third year. So they get to see us and we get to know them too.

MEMBER BARRIAULT: A co-op system.

MR. HAWTHORNE: And those students that we see the possibility of offering positions to, we've already got our arms around before they finish their degree. So there is a way of managing that.

And on the other end, we put in place a pretty strong knowledge management program to capture that experience as it left. We had that audited by IAEA. The

IAEA do an awful lot of stuff on the knowledge retention piece. And so we have a kind of exit strategy for people to help manage that.

It's a challenge to do it. You have to be quite rigorous in that and there's times when we've actually asked people to stay a bit longer than they would like so that we can be sure that there is a replacement.

But by and large, I mean the one thing -- it's easy for an old guy like me to think we know everything but some of these young people that come in are very sharp, very bright people, and as we replace the technology, then it's more relevant to their age group than it is to the people who have been there a longer time. So I think it's been managed pretty well.

MEMBER BARRIAULT: Thank you.

Next question if I may. On the whitefish program, entrainment/entrapment, what is the progress of that file? Do you find that you're seeing positive results coming and are you doing some research and doing some work with DFO?

MR. SAUNDERS: Yeah. We were looking at not only whitefish but just fish populations in general and we're looking at it both under the EA follow-up and under some of the R&D we're doing.

And yeah, we actually have collected the

data and proposed it. As part of the DFO Act sort of review that we're doing, we've used a lot of this data actually to support that.

So we know the numbers very well. They're actually very positive numbers in terms of having low impact and, you know, we'll certainly be putting all that out in the public domain fairly shortly.

But it's a good chunk of research. I would say that probably from a QA point of view and from what you would expect of this kind of research, it's topnotch, right at the leading edge of what you do, both in terms of the number of measurements and the quantities we observe and so forth.

MEMBER BARRIAULT: So it is positive.

Is DFO still on the line?

THE PRESIDENT: DFO, are you still on the line?

MR. HOGGARTH: Yes. It's Tom Hoggarth for the record. We're still here.

MEMBER BARRIAULT: On the issue of the whitefish entrapment/entrainment program, do you have any comments to make?

MR. HOGGARTH: At this point, no. We're working with -- well, with your staff, CNSC staff as well as Bruce on their application for authorization and we've

just seen sort of the summary information and at this point don't have all the detailed information to provide direct comment.

MEMBER BARRIAULT: Thank you.

Can I ask CNSC to comment?

MR. HOWDEN: Barclay Howden speaking.

I'll ask Andrew McAllister and Caroline Ducros to respond. Thank you.

MR. McALLISTER: Thank you, Mr. Howden.

Andrew McAllister, Acting Director for the Environmental Risk Assessment Division.

I'll talk a bit about that under what we're doing under the *Nuclear Safety Control Act* and then if Dr. Ducros has anything to add with respect to other aspects of the *Fisheries Act*, she could do so.

Sort of impingement/entrainment around whitefish has been a matter that's been looked at extensively at the Bruce site. It's been the focus of different environmental assessments. It's been the focus of ongoing monitoring.

A real key component of that came out of the environmental assessment follow-up program and so Bruce Power had put together an impingement and entrainment monitoring program that was reviewed by CNSC staff and other stakeholders. CNSC staff accepted that program. It

was based on best practices, operational experience and guidance from DFO and the Electrical Power Research Institute in the U.S.

To date, the results are confirming the predictions from the environmental assessments of no significant environmental effects. To put that in context, the most recent results when compared to something like the commercial harvest or the quotas associated with lake whitefish is something on the order of .2 percent. So we're talking about small values relative to more population metrics.

And I'll look to Dr. Ducros if there's anything else to add.

DR. DUCROS: Caroline Ducros, Acting Director of the Environmental Assessment Division, for the record.

All I have to add is that under the NSCA and under the *Canadian Environmental Assessment Act* we've been assessing the impacts from impingement and entrainment at the population level.

But the *Fisheries Act* metre, if you want, is different. There's a definition of serious harm in the *Fisheries Act*, which is the death of fish. So the threshold is much lower.

And this is where we're waiting to do a

technical review of the submission that we just received on February 2nd from Bruce Power, which outlines their assessment on the need for *Fisheries Act* authorization.

And we'll get back to Bruce Power. We've made a commitment with DFO to meet Bruce Power in March to discuss that technical review and to discuss whether there's a need for *Fisheries Act* authorization.

MEMBER BARRIAULT: Thank you.

THE PRESIDENT: Can I ask a process question. I always worry when more than one regulator get involved in a file. So who comes first? Do we need to license and then DFO authorize or DFO authorize and then we need to license?

DFO, why don't we start with you.

MR. HOGGARTH: It's Tom Hoggarth for the record.

For DFO, in a situation like this we're talking about an existing facility and we did have -- in 2007 we came out with a policy on existing facilities and within that policy it speaks to when DFO becomes aware of projects or facilities that may be in non-compliance with the Act, we then start the process of working forward with getting them in compliance with our Act.

So, at this stage, we're doing that through our Memorandum of Understanding that we have with

you guys, as well as working with Bruce Power. So DFO, we are fine with the process that's going right now.

THE PRESIDENT: It would be nice, though, from our perspective, then, where if and when we decide to award a license extension for the next five years all the ducks are lined up, including the authorization from DFO.

MR. HOGGARTH: It's Tom Hoggarth, for the record.

I agree with you. It would be -- for DFO as well it would be nice to have all the ducks in a row at the same time, but I would leave it to your staff to talk about whether it should be a license first and then the *Fisheries Act* authorization or if the two of them have to come together.

THE PRESIDENT: Staff, anybody wants to venture on how this will unfold?

DR. DUCROS: Dr. Caroline Ducros, for the record.

I understand your concern. While both *Fisheries Act* and the *NSCA* do afford protection for the environment. As I mentioned, they are talking at different levels. They are complementary acts and one doesn't curtail the authority of the other.

So I do want to point back to Mr. Hoggarth's point about the principles that they have behind

their existing facilities statement. One of the principles is that compliance is mandatory and that compliance will be encouraged through communication and that a priority for enforcement action will be guided by the degree of harm to fish and fish habitat caused by the existing facility. So there is a risk-based element to that policy and I think the fact that we are in good communication with Bruce Power and have been since March of last year and they are in the process of doing the assessment, I think --

THE PRESIDENT: So the application is in? I'm trying to understand where you are in the process. Has Bruce now submitted an application to you which you are assessing together with DFO?

Bruce, do you want to clarify?

MR. SAUNDERS: Yes. I think we have provided what will form the application eventually and at this stage we are in technical review. So what is happening now between CNSC staff and DFO and us is, they are reviewing how we did the calculations and how we did the sampling and once they have reached that part and we have decided that all the technical numbers are correct, then we actually start to talk about is an authorization necessary or are offsets necessary, and so forth.

The other complication of the Act, which I think will make your objective for April pretty unlikely is

that this Act also requires us to perform consultation on this. That consultation really can't get into full string until we have agreed on all these technical issues. It is certainly progressing, but it can't go all the way down the road and so the likelihood of finishing that before April, I would say, is as close to zero as it is possible to be, just because that takes time. You know, you have a bunch of stakeholders you need to talk to and agree with, and they need time to think and review about what you give them and the odds that we can close all that off between now and April I think are pretty slim.

However, I think you can take a lot of comfort in the environmental assessments we did on our ongoing programs; our risk assessment that we do that clearly indicates that we are not actually having a serious impact on the fishery or the environment; all of our fish species, if you put them all together, less than 1 percent of the sort of normal limits that they put on fishing. So it's clear that we are in a very small portion of this realm.

THE PRESIDENT: Dr. Barriault...?

MEMBER BARRIAULT: I just have one question. With all units operating have you noticed any increase in plume temperature and the actual volume of the plume coming out?

THE PRESIDENT: I think it's a good time to get the Environment Department in front of us so they can contribute to all the environmental, thermal issues that I am smelling are coming up to the fore.

I'm sorry to interrupt, Dr. Barriault.

MEMBER BARRIAULT: No, I'm really waiting for Bruce to reply.

MR. SAUNDERS: Yes. So the answer would be of course with four units instead of two there will be an increase in temperature. Last summer unfortunately or fortunately, depending on how you look at it, never really got all that warm so we didn't really see much of an impact last year. However we have got one of the main focus of the EA follow-up program was monitoring the input from the stations and where it is.

We of course know what the limits are. We have provincial permits and so forth that we have to follow here as well. Two regulators in this area is an understatement actually. There are actually four, if you want to count them all, all of which we have some kind of permit from and sometimes on the very same thing.

So we have these permits already on delta T that they can't violate and so we are well within those permits. So yes, will it increase to four instead of two? It will. Logic tells you it must, right? However, we

won't exceed the permits that we are specified to have.

MEMBER BARRIAULT: So the permits were based on four were they, as opposed to two?

MR. SAUNDERS: That's right, the permits were based on stations, yes.

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

THE PRESIDENT: Well, I would like to hear from environment since we opened up the environmental issues. What is your comment on the environmental assessment, the thermal issue that was around environmental emissions, et cetera?

MS ALI: I can speak to the thermal issue and then pass to CNSC. Environment Canada has been involved all along working closely with the CNSC and Bruce Power on all the information provided on thermal monitoring for round white fish. Recently there was an action item issued by the CNSC for additional information.

Those reports have just been submitted to us and we are in the process of reviewing those together with the CNSC and we will have an update by Day Two. But we need to review that information to establish the level of risk.

Andrew...?

MR. McALLISTER: It's just to complement

Ms Ali's question.

You know, this has been a matter -- the thermal issue is something we have approached in a consistent manner across the power plants. We have gone through this with Pickering. We have gone through it with Darlington and a similar approach is being applied to Bruce, all to say is that it is a work in process. We have been doing it under our compliance oversight, regulatory oversight and, as Ms Ali mentioned, we are in the process of reviewing some additional information. We will update you on that as part of the Part 2 proceedings, as well as the path forward.

THE PRESIDENT: Just while I have Environment Canada here, there was this intriguing -- on page 72 of staff there is:

"We are informed that the Crown has withdrawn all charges under deleterious substance provision of *Fisheries Act*." (As read)

Are we talking about the hydrazine charges, 72, staff?

MS ALI: Nardia Ali, Environment Canada, for the record and I will comment. I will give a general answer and then I will pass to Duck Kim because he has been more closely involved with this.

So yes, the Crown dropped all the charges and Environment Canada and the CNSC have been working with Bruce Power on Best management practices to prevent future releases of hydrazine into the environment. If you need more detail on that I will pass to my colleague, Duck Kim.

THE PRESIDENT: I just want assurances that you are satisfied that now the hydrazine leak is under control.

MR. KIM: Duck Kim, for the record, Environment Canada.

The sources of the hydrazine releases that were identified as part of the Environment Canada enforcement action have been dealt with. The remedial actions are related to the enforcement action is not complete yet. There is -- I understand by the end of this year the treatment for active liquid waste system for instance will be completed.

So, yes, we are satisfied with the level of effort that Bruce Power has made and we are also convinced that these measures are sufficient to protect the environment from those sources.

Thank you.

THE PRESIDENT: Thank you.

Monsieur Tolgyesi...?

MR. HOWDEN: Dr. Binder, may we just tidy

up on the *Fisheries Act* process?

THE PRESIDENT: Go ahead.

MR. HOWDEN: Okay. So Ramzi Jammal is going to provide the details, but basically we are committed to an efficient process of this review under the *Fisheries Act* because we are working with DFO, but in terms of how the permits line up or don't line up, I'm going to ask our Chief Regulatory Operations Officer to comment.

MR. JAMMAL: Ramzi Jammal, for the record.

I'm sorry, you asked the question about the process of what comes first, the CNSC license or authorization. Under the *NSCA* and with discussions as in our CMD outlines and the EA reports, there is no impediment to issue the license under *NSCA*. As we go forward with respect to the assessment under the DFO, the MOU between CNSC and DFO, we have all of the regulatory tools in place in order to ensure that Bruce Power will meet our regulatory requirements. I just want to clarify the fact when you ask about the process, as we speak today there is no impediment under the *NSCA* to issue the license.

As the application submitted by Bruce Power with respect to the requirements for DFO and it is being assessed by staff, if the license is issued and if there are any regulatory compliance issues, we have the regulatory tools in place to make sure that Bruce Power

will be compliant with all requirements.

THE PRESIDENT: Thank you.

Monsieur Tolgyesi...?

MEMBRE TOLGYESI : Merci, Monsieur le Président.

Just a short question about periodic safety review. According to Bruce's presentation a periodic safety review will be presented in 2015 for Bruce A and 2019 for Bruce B. I am sorry. Don't go away I have a question for you. You are not off the hook.

So considering that there is much higher equivalent full power operating hours for Units 5 to 8, should the periodic safety review for Bruce B be pulling forward or completed earlier?

MR. SAUNDERS: Yes, Frank Saunders, for the record.

The answer is it will be completed earlier actually. The 219 is -- we will do it before the 2019 date so the Bruce A PSR is already in progress and CNSC staff has already reviewed and accepted our basis document for that review and it will be done sort of early summer of this year and we will promptly start on the Bruce B one.

The second part of your question around fuel channels, that the PSR doesn't actually rely on -- I mean that the fuel channel issue doesn't rely on PSRs, all

the PSR does is look at the station holistically and look for how you are dealing with all the problems and out of that comes an improvement plan which would include things like replacing pressure tubes at some point and steam generators or other things.

So the PSR just becomes a roadmap to the future, but it doesn't actually affect current safety. I mean there will be nothing new in the PSR that we don't already look at on pressure tubes, so it doesn't affect the current safety. It allows us to look out 10 years into the future essentially and say here is what the plan is for the next 10 years and then that's what the PSR will do.

THE PRESIDENT: So just to clarify, so is the PSR going to bring new things into the regulatory scheme? Is it anything to do with safety, increased safety, or is it just a different timescale that we are talking about?

MR. SAUNDERS: The basic difference with a PSR is it requires you to go and do a comparison against modern codes and standards that may be weren't fully in place when you built the place, you know, 30 years ago. So the notion of a PSR is to make sure that you don't get so out of date that you miss something that was important in the new *Codes* and standards and so in most regimes that is actually the only time that is done.

In Canada it is actually quite a bit different. We review against modern *Codes* and standards as you can see by the 25 or so that we are adding into this license. We do that review all the time. So this is not, I would say, really unusual for Canada. What it really does, though, is let you lay out the next 10 years, plan those 10 years out and clearly, you know, state where things need to be done from a safety point of view in those 10 years.

There are many other things around the operation of the plant that won't be in the PSR, but from a safety point of view they are in there. So it gives you a look forward and a level of confidence. It does pull all of the standards into one review versus doing them individually, so it has advantages. But mostly it's just about that holistic look at the plant against modern *Codes* and standards. That is the primary advantage of the PSR.

THE PRESIDENT: Thank you.

Monsieur Tolgyesi...?

MEMBER TOLGYESI: Thank you. On page 26 of what, of the environmental assessment, they are saying that the whitefish decline are likely reflective of background trends due to lake-wide changes in the ecosystem food web.

What is the relative additional impact for

Bruce? You know, how are these changes observed and what is the relative additional impact of Bruce on these changes?

MR. SAUNDERS: As to how these things are observed, they are mostly coming out of the ministries and -- I'm sorry, are you looking for it at the back?

MR. HOWDEN: I will ask Andrew McAllister to respond. Thank you.

MR. McALLISTER: Thank you.

As is evident by the write-up here, ecosystems are constantly changing and are from, you know, in a spatial sense, in a temporal sense. Really, though, at the end of the day you have to ask yourself what is the impact of sort of a point source like the Bruce site on that ecosystem on that population. Delineating a population is a challenge, as is evident.

As Mr. Saunders outlined earlier, the variety of research that is going on to try to get a bit better understanding around the population dynamics and that, but in the absence of that we look to surrogates or other indicators that can tell us just what kind of level of impact a site might be having. And as we have referred to in some previous answers was if you look at the impingement entrainment, the amount that is actually being impinged and entrained is really a fraction of the

allowable commercial harvest for that area for lake whitefish, for example, and that is what gives us confidence that in fact we are not looking at really a measureable impact on the population.

MEMBER TOLGYESI: Environment, do you have anything to add?

MS ALI: I was going to add with respect to the thermal effects, when we look at the new information that has been provided on the eggs' survival data and things like that, that information will give us an idea of, you know, what level of egg mortality there is and if there is any significant impact to local round whitefish populations. So we have to review the new information that is coming in and then we can comment further at Day Two.

MEMBER TOLGYESI: Do you observe and effects of -- we are talking about global warming, which means our lake temperature probably will rise. Do you observe any effects now over the last 20-30 years?

MS ALI: I would have to get back to the Commission on that because the people who track the lake-wide temperatures, I would have to check with them and get back to you.

Duck, do you want to add anything?

MR. KIM: Duck Kim, for the record.

The data -- so specifically to do with the

Bruce Power's operation in Lake Huron we have two sets of data so far from 2003 to 2004 and 2012 to 2013. And previous to that before the shutdown of some of the units at Bruce Power there were -- at the early phases of operation of Bruce A there were other thermal studies.

I think it is very difficult to make any conclusions in terms of whether there has been any climate change effects on lake-wide temperatures. Certainly I think we need more studies, but the overall predictions are that in southern Ontario there will be gradually increasing temperatures, air temperatures, which would be associated with ambient temperatures in the lakes to also increase, but the rate at which that would happen is a debate in the climate change science forum that I think at this point it is premature to make any conclusions on.

MR. McALLISTER: But just to wrap that up, what Mr. Kim said is, what this highlights is, though, the importance of having sort of that current and that new science brought to bear in the process and climate change is an example where, you know, there is uncertainty around the science and as the science gets advanced it gets brought to bear as appropriate in sort of our regulatory oversight, whether it be in relicensing, whether it be with respect to environmental risk assessments, obviously it gets brought to bear at the appropriate points within our

sort of regulatory oversight and that helps inform the kinds of conclusions and recommendations that we give you.

MS ALI: Nardia Ali, Environment Canada, for the record.

I just wanted to add one point that might be useful for you. We think moving forward with temperature analysis and modelling, it's important to note that absolute temperatures would probably be the better measure to use rather than the difference between the plume and ambient temperatures when you are looking at protection of fish. So if ambient temperature is expected to change with climate change, the most biologically significant temperature to consider would be the absolute temperatures that could ultimately affect like whitefish eggs' survival or things like that. So moving forward that would probably be where we need to focus in setting limits.

MEMBER TOLGYESI: So what is that absolute temperature?

MR. KIM: Duck Kim, for the record.

I think the word "absolute", may be clarified. It is the actual temperatures in the lake rather than what -- I understand Bruce Power being regulated for delta Ts by the Province, so delta Ts are useful that way. But in terms of protection of fish, the actual temperatures that the eggs or the fish are

experiencing would be more valuable. So the absolute temperature, we mean actual temperatures.

Thank you.

THE PRESIDENT: Thank you. Move on to the top of the line.

Dr. McDill...?

MEMBER MCDILL: Thank you.

My question is on tritium. There is a map on page 22 of the Environmental Assessment Information Report and the data are reported on page 29. The graphs are on page 28.

--- Pause

MR. SAUNDERS: We are trying to find it.

MEMBER MCDILL: Yes, that's okay.

--- Pause

MR. SAUNDERS: Page 28.

MEMBER MCDILL: Yes. So the map of the area is on page 22. The graphs are -- the spike for Bruce A42 and B43 are on page 28 and the discussion is on page 29.

Where are those wells on page 22? I know it says that properties to the east are protected, but it doesn't say anything about south, for example.

You might want to put your microphone on, please. Thank you.

MR. SAUNDERS: Yeah, so just understanding the question here, you are looking to understand where the wells are in particular?

So these ones that you are actually seeing here, of the table in 4-5 and the figure are really critical groups so not necessarily wells, right. So from those critical groups --

MEMBER McDILL: The groups are here, but I'm talking about the wells.

MR. SAUNDERS: Yes.

MEMBER McDILL: So tritium concentrations and monitoring well Bruce A42 and B42. So those are not on here? These are people.

MR. SAUNDERS: Yes. No, unfortunately the map of the wells is not on here but we can provide that data or CNSC can provide it to you, for sure.

MR. McALLISTER: Sorry. Andrew McAllister, for the record. Sorry.

Just if we orientate ourselves on that figure, as mentioned, those references are to wells on the site located between the stations and the shoreline associated with both Bruce A and Bruce B.

MEMBER McDILL: So is there any potential flow towards the park?

MR. McALLISTER: No, there isn't. As

indicated in the -- oh, sorry, in Inverhuron Provincial Park?

MEMBER MCDILL: Yes.

MR. McALLISTER: I will ask Dr. Shizhong Lei, who has a better knowledge of the groundwater flow system in that area to answer that question.

DR. LEI: Shizhong Lei, for the record.

The groundwater is flowing actually and the groundwater around the nuclear power reactors are captured by the foundation drains. So everything is flowing to the centre of the plants. Therefore, it is not hydraulically connected to the environment.

MEMBER MCDILL: Thank you. It just says that A and B are hydraulically isolated from properties east of Bruce Power. It doesn't say it is captured in a well. So if we could -- and I think for people who live in the area maybe another picture on Day Two with where these wells are and where the hydraulic sump is might be useful.

One of the spills was 2012 and it peaked at roughly 4500 becquerels per litre in April, so with a half-life of 12-13 years, when is that going to dissipate?

MR. SAUNDERS: I'm not sure if you are addressing that one to us but, yes, if it is tritium, which it is, you are talking, you know, 40 years or so before you get to levels that have decayed away. So you have to keep

monitoring these and checking them as you go, right.

MEMBER MCDILL: Because the spill from 1991, which is reference 30, is still pretty significant in terms of level.

MR. SAUNDERS: Yes. And of course you know spills in particular, right, but there is low level kind of leakage that goes in those drains as well and on the site the geology there is all rock. So the plants actually sit in a hole in the rocks, so they are actually kind of an ideal situation because all the water runs back in and we pump it up to where we can monitor it and check it. So it sits there in the wells and we can get at it. It doesn't flow out. So in that regard it is kind of an ideal site, kind of an ideal location to do that kind of work.

We certainly have wells around the area as well that we sample both deep and shallow wells for tritium out in the public domain anywhere where there is public residing. We can provide all that for Part 2. It's probably a good idea to put it out. It is a fairly --

THE PRESIDENT: Okay. That would be my question I was looking for, out. Just to be clear, on figure 4-7 and 4-8 on page 28, okay, this is the average tritium concentration in groundwater. So again, the language again is an issue.

When you said the reference location in the vicinity of Bruce A, this doesn't tell me is it on-site or outside. It doesn't tell me if there is a near residential vicinity. It can be a couple of miles outside. And the spike of Well 42, I don't know why that spike is that there, what is the characteristic of well 42 and where is it. The same thing in 43 for Bruce B. It is a peculiar kind of reading it.

MEMBER MCDILL: The simple solution is Day Two and some commentary, I think.

THE PRESIDENT: And having drinking water in the community would be nice also.

MR. SAUNDERS: Yes. We have of course a very active monitoring program. As you guys know, it's not only water but fruit and vegetables, potatoes, you know, grains, whatever people might consume that is monitored around the site and we have a lot of people who participate voluntarily in that and provide us the material.

So I think it would be really worthwhile to put a bit of an educational piece together on that. So we will do that.

MEMBER MCDILL: Those are my two. They are sort of both the same thing.

THE PRESIDENT: Okay.

Ms Velshi...?

MEMBER VELSHI: Thank you. My question is around security, so the first one is to Bruce Power. In your written CMD on page III on industry leading security and emergency response -- Roman numeral "III" -- so you talk about amalgamating your emergency and protective services. Can you talk a little bit more about what led to that? Is that kind of common industry practice and what your experience so far has been with that amalgamation?

MR. SAUNDERS: Yes. I guess it was a common practice five or six years ago when we first did it and what really brought it to mind was your ability to respond to events and generally. If you continue to segregate all these forces, then you always have a bunch of people who are essentially sitting on the side lines not integrating and most of the time what you need is manpower. So it occurred to us it made a lot of sense to integrate them. They all reported in one organization anyway, they just had different leaders so we decided at the time to integrate them.

And I would say that since that time it has been an outstanding success and, you know, many companies around the world actually started following this and we still get some significant requests to come and look at how we do that, including one we just got from the UAE to come and have a look at the combined security force in

their new facility they are building. It is not only cost-effective, it also has a very effective response matrix. You get a lot of people who can respond in an event if they are under one command and control structure. And so to me it just made a lot of sense and everybody agreed. We did it. We haven't had any problems with it.

The issue people say is can the firemen and the security guys and the other people work together? And the answer is yes, sure, they can, right? There is no real reason to be otherwise and it's just a tremendous resource.

And we deploy our EME, for example, for our post-Fukushima work. It is the fire guys who actually deploy the fire trucks and pump the water, as you would expect, because that's what they do all the time so it works well for them. It is the security staff that deploy the generators and hook those up and it works easiest. They have had no challenge doing that. The command centre is under control of mostly the security folks because they do that for a living so they are very comfortable with doing that.

So there are a lot of synergies between those two groups that you can take advantage of and in reality they actually work together and they like to work together. And we get a fair amount of cross-traffic now

between people who are leaving one organization. You know, a security guy decides to become a firefighter and so forth. We have excellent training facilities for all of those approaches so we can cross-pollinate to some degree.

MEMBER VELSHI: Thank you.

Staff, do you have any comments?

MR. HOWDEN: Barclay Howden speaking. I will ask Raoul Awad, DG of Safeguards and Security to comment.

I would just like to introduce to say that Bruce Power, the security program has been fully satisfactory over the whole period, so they are an industry leading organization.

MR. AWAD: Yes. Raoul Awad, for the records. I am the Director General of Security and Safeguards.

Actually, regardless of the initiating event, if it is natural hazard or a security incident the emergency management should work in the same pattern and combining the security and the emergency management is a very good idea. And we see it after Fukushima not only in Bruce Power, but OPG too. They have the same structure.

Even with the CNSC, I am responsible of the security and emergency management. I think the interaction and the synergy between both disciplines, if

you like, is more beneficial than --

MEMBER VELSHI: Thank you. My second related question on security is on page IV around vehicle searches that you have initiated. I read in here that it is not a regulatory requirement so I wanted to first hear from Bruce Power how that has been received and then perhaps hear from staff on is this something that you are looking at as making it a regulatory expectation?

MR. HAWTHORNE: Duncan Hawthorne, for the record.

To be quite honest with you, we thought it might be more of a challenge than it has been. Obviously you have to walk a fine line between peoples personal privacy and security of the site, but after the events that we all witnessed in Ottawa and other places, I think people understood that this was another layer of security that we are applying and doing random vehicle searches was an appropriate way to further improve things.

We also have -- of course, CNSC staff have written to us and asked us to consider our arrangements in light of the recent events and ensure that we are taking reasonable steps to mitigate against the sort of events that we have all seen played out before us here.

So as a new thing to do, you know, there is an issue about what -- if you find something that is

inappropriate, how do you deal with that? So we have to manage those sorts of things, but our staff have generally understood that this is all being done for their own personal safety too. So by and large it has been reasonable and well received.

MEMBER VELSHI: Thank you.

MR. HOWDEN: Madam Velshi, you wanted a comment from us, so Raoul Awad will provide the comment.

I just wanted to point out that Mr. Hawthorne said he has received correspondence from us. There has been correspondence from the President to the Presidents of all the big utilities. As well, Mr. Awad has sent a protected letter to the security folks at each facility.

MR. AWAD: Raoul Awad, for the record.

Actually, after the letter that Dr. Binder sent to all the high security side we sent a clarification what our expectation could be and of this circumstance. You know the threat is evolving all the time and since the last three years we noticed on the international scene and in the international scene to some kind of higher -- the need of higher -- for higher awareness on the security side and this is exactly what we expect our licensees to do.

MEMBER VELSHI: So are random vehicle searches being done by other licensees?

MR. AWAD: I think we started with the Bruce -- Bruce Power started. OPG is following. I think Point Lepreau is a different site because they have a gate at the entrance that they can search the vehicle in the entrance, but OPG to Pickering they have similar measures, too.

MR. HAWTHORNE: Excuse me. Sorry. Perhaps I could have explained, Ms Velshi.

The relative -- at our site is different and I think there are different measures appropriate to each. If you look at our site plan you will see Bruce A and Bruce B, but we actually do check vehicles on the way in, to make sure that anyone who enters has a security badge for themselves and for the car, because there is car parking inside our site and then there is obviously a further check as people move inside a nuclear place.

So we do have three entrances, three vehicle entrances into our site, a very busy traffic flow and so we thought that given our site configuration this would be the appropriate way to deal with it and to intercept cars earlier in the process than we would typically have done so. I think there is a case of what is appropriate given your site demographic.

MR. AWAD: If I could add, Raoul Awad, for the record.

Searching a vehicle is not the only measure. There is a whole procedural change that the licensee implements now that includes not only the search of the vehicle, but even assuring that patrols in the area outside the protected area are very effective and very efficient to detect anything.

I can add to this one, there is a special, what we call behavioural program. Then when the security officer can look to the behaviour of the people during the search and have some impression about, you know, what is behind this one. And it is working very well. I can give you assurances on this one.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Thank you. Monsieur Harvey...?

MEMBRE HARVEY : Merci, Monsieur le Président. On page 40 of the staff CMDs under pressure boundaries, it's just a question may be of how it is written. The first paragraph under pressure boundary, the last sentence is if Bruce Power has elements which constitute a pressure boundary program. Why say it like this, to write it like this, because you have a program, you don't have a program. What is an element and how many elements constitute a program?

MR. LAFRENIÈRE: Ken Lafrenière, for the

record.

So Bruce Power -- it should read "Bruce Power has the elements which constitute a pressure boundary program as required by the current license, has all the elements required for a pressure boundary program".

MEMBER HARVEY: Okay. Okay. If you say it like that I don't have any problem. Another question is the -- I am sorry, is the independent Environmental Monitoring Program. Maybe it's the first time you get that from Bruce -- I mean not from Bruce, by Bruce. And my question is, have you compared this data with the other data that you can have given by Bruce or other agencies on the same elements here?

MR. HOWDEN: Barclay Howden.

I believe we do, but I am going to ask Kiza Francis, who is the Director of Environmental Compliance and Laboratory Services Division.

MS FRANCIS: Kiza Francis, for the record.

The short answer is yes, we do compare. However, they can't to be compared directly. The places that we take the samples aren't necessarily the exact same spots. The lab analysis methods aren't exactly the same, but we do look at our results and we do look at Bruce Power's results.

In terms of other agencies at this time,

no, we are not comparing, but it is something we can consider.

MEMBER HARVEY: You find a certain similarity or constant?

MS FRANCIS: Kiza Francis, for the record. Absolutely. And our program process has it if there is a result that came back that wasn't similar we have a process to immediately look at that number and try and determine why it's not similar.

MEMBER HARVEY: Okay. What is the schedule? Do you have the intention to have, well, to have a sample each year or every two years or do you have a fixed schedule or is it periodic?

MS FRANCIS: Kiza Francis, for the record. The current plan is to sample for the next couple of years and then to determine whether or not we continue annually or based on risk, as long as there is no impact on the environment. That is our goal, but the current plan -- let me start again. The current plan is to sample for the next couple of years for sure and then to determine what the sampling program will be.

MEMBER HARVEY: Okay. Do you have a comment on those data?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

The program extends beyond the facilities under the nuclear power plant. So Kiza was talking about sampling rate across Canada, uranium mills, mines, et cetera and the Commission will get that information in due course. For the site, I will say that my site inspectors -- the CNSC site inspectors form part of that sampling program and that is occurring at all nuclear power plants in Canada.

MEMBER HARVEY: Okay.

MR. HOWDEN: Mr. Harvey, I would also like to add just one of the values of this program that we are running is all the results are posted on our website. It is on an interactive map so people can actually see where the samples were taken which probably helps people orient. It provides an analysis and also detailed reports are available on request.

So it's a really not only to do independent sampling, but to be really a valuable tool for local folks to see what is actually going on in their own community.

MEMBER HARVEY: Okay. Merci.

THE PRESIDENT: Thank you.

Dr. McEwan...?

MEMBER MCEWAN: Thank you, Mr. President.

A couple of questions around -- I guess a

one part -- two-part question. Page 32 of the Bruce CMD.

So the graph is showing personal contamination events. So you have gone from -- am I reading this correctly that in 2010 there would have been 1,200 instances where an individual working on the site received some form of contamination?

MR. SAUNDERS: Yes, that's correct.

MEMBER MCEWAN: And that contamination could be anything from inhalation to ingestion to --

MR. SAUNDERS: Contamination is actually just something on your physical person, not inhalation. In this case inhalation is a different thing. It's a dose uptake so it's not counted the same way.

MEMBER MCEWAN: So you don't count inhalation as contamination?

MR. SAUNDERS: That's correct. You wouldn't be able to detect it that way. Inhalation, if it was taken in somehow in an unplanned way or whatever, we use a whole body monitoring program and those things to detect that.

MEMBER MCEWAN: Sure.

MR. SAUNDERS: This is strictly for people coming out of a higher zone area in the plant to a lower zone area.

MEMBER MCEWAN: Just hand or foot

monitors?

MR. SAUNDERS: Hand or foot monitors and you find it, yes.

MEMBER MCEWAN: So, again, so the use of English and I think it is how we use data, I mean if somebody has an inhalation of a radioactive substance, that is contamination. I mean you may detect it in a different way, you may describe it in a different way, but it is ultimately contamination and the same if they ingest it, probably a little more difficult to assess.

Do you have any global data paralleling this on what I would define as contamination across the site?

MR. HAWTHORNE: For the record, Duncan Hawthorne.

We would refer to it as an unplanned dose uptake --

MEMBER MCEWAN: Okay.

MR. HAWTHORNE: -- which is a different thing, which again is tracked and monitored.

These events relate to people, you know, undressing and dressing and discipline as they come across barriers and they alarm our equipment. So it's a lot of behavioural stuff.

An unplanned dose uptake would suggest

that someone has worked in an environment where, you know, they have taken a dose that we didn't expect them to experience and that is treated at an entirely different level, but we do monitor in terms of unplanned dose uptakes. That would be reported to CNSC staff and we would conduct a very detail review in that regard.

MEMBER MCEWAN: So again, it would be helpful to see the data in one area, sort of in one chapter or one section so that you can actually look at unplanned events and just look at what that trend is as well. So what happened between 2010 and last year, because it's really impressive.

MR. HAWTHORNE: I would like to take all the credit for that, but of course at that time we were also in the restart project, so a large amount of activity, a lot of people run in and out across the ones that was already -- so that some of it was related to that high-level of activity at the time.

MEMBER MCEWAN: Okay. So if I then go to page 33, at Bruce A in 2012 there is a fairly large spike in collective dose. What was the cause and was that -- so again to understand, collective dose is cumulative dose over a large number of people?

MR. SAUNDERS: Yes, that's the dose over the Bruce A population. 2012 at Bruce A was a year of

significant outages and that's really what has driven it and about 80 percent of even that was driven by the Unit 3 West shift program which happened then, which was a fairly high dose work that had to be done.

MEMBER MCEWAN: I see.

So going to page -- just following on from that where you discuss the alpha event, you had -- I think the figure was 500-odd individuals who received a dose because of that alpha event. The highest value was 6.9 I think. Do you have any long-term follow-up of these individuals? I mean if they leave your site do you have a way of tracking them into the future? Do we understand truly that there are no long-term events from this?

I think it's highly unlikely, but it would be good to have solid data one way or the other.

MR. SAUNDERS: I guess the answer is kind of yes and no. All of this work goes into their dose records which are maintained here in Ottawa, so it's clear they are there. We have measured all these people several times so we know the data and the trends that were there.

In terms of overall health effect, yes, we don't have a permanent connection with everybody that would have got alpha dose for their lifetime for sure, but it is all there in the dose record so certainly people who are studying this in the future to see if it had an impact,

the data would be available for them to look at. So you know, you could look at, you know, for example early deaths, early cancers and compare back to the data the dose that people had and hopefully make some determination on whether it might have had an impact.

Typically that is very hard to do for the kind of dose levels we are talking here, it would have to be very specific stuff because this dose is just relatively trivial in the scheme of things. But the data is there. It is stored. It is referenced in terms of the event and how quickly it was absorbed and all that is all in the dose record.

THE PRESIDENT: Thank you.

Dr. Barriault...?

MEMBER BARRIAULT: Just a brief question. Does the reactor have a failsafe mechanism whereby, if all operators were disabled, it would shut down automatically?

I don't know if that's a security issue or not.

MR. SAUNDERS: I guess the answer is no actually. I mean, it would shut itself down eventually because it would run out of a parameter of some sort and it would shut down.

But if everybody in the reactor just

for some reason was incapacitated, there is no heart monitors or anything like that that would simply turn it off. You know, in fact, the reactor runs pretty much on automatic, as you know, but if there was no human intervention it would drift over a limit or something eventually and it would shut itself down, but there's no direct contact, no direct link.

MEMBER BARRIAULT: Not automatically like on locomotives, for example, on trains there's dead man's pedal or push buttons or whatever. Okay.

Thank you.

THE PRESIDENT: Mr. Tolgyesi...?

MEMBER TOLGYESI: Merci.

According to staff CMD, page 99 -- don't look, I will tell you what's there.

--- Laughter / Rires

MEMBER TOLGYESI: CNSC expected to receive in January, 2015 Bruce decision to install a containment filter venting system or provide an alternative option.

Was this decision received?

MR. LAFRENIÈRE: Ken Lafrenière. Yes, it was received and it's currently under CNSC staff review.

MEMBER TOLGYESI: So it's a little bit

too premature to say that, what was the decision of Bruce?

MR. LAFRENIÈRE: So it's part of the Fukushima action updates and they're all on track, so the analysis of that will be done in due course.

--- (off mic)

MR. LAFRENIÈRE: Sorry, Ken Lafrenière here, for the record.

My VP just reminded me that we will obviously update the Commission on the Fukushima actions when we submit the Integrated Staff Assessment Report which is presented annually.

MR. SAUNDERS: And so I guess we can be a little more specific in terms of what was submitted.

So we've submitted now closure requests for all the items including the one on containment.

Keep in mind that Bruce already has a filter guard discharge system and part of our EME actions for Fukushima was to provide extra power supply to actually run that system. So we already actually have an emergency filter guard discharge system.

What we looked at then was what the

odds are that we would need more in some kind of a really huge or unusual event. The analysis basically says it provides no real benefit to have the system because it's unlikely, however, we are pursuing two designs to actually -- we're installing the fittings, this outage coming up in the spring to do that, and we're pursuing two designs to achieve a sort of another layer of defence there, so some kind of a filter guard discharge.

It's a bit of a challenge in the Bruce site. Our Delta P on the containment system is very low, so some of the solutions people have used around the world don't really work on the Bruce site. So we have a new design coming out of AREVA that we're looking at that would actually we think be plausible there. The design's not finished yet though. And we're also looking at a portable system that we could use to also do that should the need arise.

MEMBER TOLGYESI: This is a little bit about the future activities. The Ontario Government is supporting Bruce No. 3 and No. 8 unit refurbishment which may potentially begin as early as 2016, which is not far away.

However, Bruce Power indicated the need to have a long-term contract with Ontario Power

authorities prior to decision to proceed with refurbishment or major component replacement.

Bruce is also requesting to extend the life of power reactors to 247,000 hours. How such a life extension may impact negotiations with Ontario Power authorities and an eventual refurbishment?

MR. HAWTHORNE: So for the record, Duncan Hawthorne.

We're kind of straying into commercial territory here, but let me just explain to you. The long-term energy plan has within it a phased arrangement for refurbishment of units. It was intended to be an optimal plan that would allow for the phasing of refurbishment of six Bruce units and four Darlington units in a way that both operators felt they could manage from a resource point of view.

The discussions were, in order to meet that schedule it would eventually had Bruce Power taking units offline before their plant life would have dictated that requirement. And so one of the conversations we've been having is, is that the right thing to do, to take units out of service in a way that we're doing it simply for coordination purposes and not because the plant requires refurbishment at that time.

That's a lively discussion ongoing right now. If you think about it just from a straightforward commercial point of view, if we take units off early we spend capital early and the cost to ratepayers goes up sooner. The Energy Minister has said very clearly that his focus is on bending the curve.

So the conversation we're having right now is, let's take the best decision for the ratepayer and think about how that might factor into a long-term energy plan.

None of that, not a word of what I just said has anything to do with a requirement to run these plants safely.

And, as we've said, there's no intervention, there's no decision, there's nothing that will be done in negotiations that would compromise our ability to meet the requirements of the *Nuclear Safety Control Act*.

The case we're making here is based on the operational life of our units as required by the *Nuclear Safety Standards* do not require us to refurbish units within the next five years. And if a commercial agreement results in us wishing to do something else, then we have to come before this

Commission and get approval to do that.

THE PRESIDENT: Okay. Thank you.

Dr. McDill...?

MEMBER McDILL: Thank you. I'd like to go to page 41 of staff's submission.

On this page there are a number of, maybe you could call them deficiencies that are not immediately safety related, but I think are something that should be discussed.

The installation of a stand-by diesel generator without obtaining documentation, the use of an unqualified rectifier and areas of improvement in a Type 2 inspection of electrical power systems, an outstanding item coming in at the end of 2016.

Perhaps I could ask both Bruce and staff to comment because a rectifier is a relatively small item in terms of nuclear power plant, nevertheless it appears to be.

MR. SAUNDERS: Yeah. Frank Saunders, for the record.

Yeah, it's interesting. It's a little bit in our conservative nature again. So we'll start with the rectifier on the emergency power generators first.

We actually were having a problem with

the rectifier, we intended to repair on one of the generators. We put a temporary rectifier in place, it was a portable rectifier, temporary.

There was nothing wrong with the rectifier, it was fully qualified, but after it was sitting there our safety folks had a look at it and said, you know, that doesn't meet the seismic, meet the qualifications because it's not properly tied down and so forth and, therefore, you can't use it that way. So at that time we needed to take it back out of there.

We tested the other emergency power generator and it didn't start automatically. We were able to start it manually, no problem and we started it and kept it running.

So the hours of unavailability you see here is that back calculation I talked about, it was from the time that we discovered it, we assumed that the thing wouldn't have worked for half the time since we tested it last and that's where the hours come, but in fact, the diesel generators were available, it was a rectifier that we were fully aware of and actually the rectifier itself met the requirements fine, it was this extra seismic issue that was a problem here.

So since then we, of course, repaired

the rectifier that's mounted in the unit and that's been resolved.

The QPS system over at Bruce A was initially not installed as a safety system, it was installed as an additional system during the refurbishment activities. We decided after a number of issues, Bruce A didn't have the equivalent of the EPG system in its original design. As we went through the refurbishment, we decided that it would be worthwhile to do that and that that was a wise thing to do.

So in reality, we started to retrofit this system to make it suitable for a safety system, you know, a safety support system in fact.

So it wasn't qualified to start with, but it wasn't intended to be qualified to start with, however, it was a good solid system and we decided we should qualify it, so we're essentially reverse engineering it to prove that it meets all the requirements.

And that work is underway. In fact, most of it is done now, there's just some paperwork and I know our chief engineer could tell you what's outstanding, I've forgotten at the moment.

MEMBER McDILL: So we can ask the

chief engineer to say what's outstanding then.

MR. NEWMAN: Gary Newman, for the record.

That system is fully qualified now.

MEMBER McDILL: And the last bit, some areas of improvement that have been identified, there remains one outstanding item related to battery testing, next paragraph down. It's not a safety concern, but...

MR. LAFRENIÈRE: So Ken Lafrenière, for the record.

I just want to point out though, in all these things we're talking about multiple redundant systems and you're pointing out those safety concerns.

So for the qualified power supply, there's three diesel generators. This is an implementation improvement due to the refurbish for the system that adds another barrier of defence in the unlikely event of a seismic event. In actuality, all these systems would have worked prior to this qualification.

The same thing with the emergency power rectifier problem at unit 8. Basically one of the generators did not black-start, so Bruce Power

took a reliability hit, but in that event there wouldn't be any -- there is no safety issue.

And the third event, we're now talking about back-up battery power supplies which are tested continuously, shown to be available. It's now into the details of how we test those and that's really what the last remaining action item is and it's basically in a discussion over the EPRI standard.

I'd like my site officer to discuss it because he follows up on every one of these issues.

MR. STEVENSON: Jeff Stevenson, for the record.

So I was the lead inspector on the inspections that identified all of these issues here. I don't really have a whole lot to add to what both Mr. Saunders and Mr. Lafrenière said.

The specifics to the battery testing issue are strictly that, they are just the methods used to do the testing and sort of the order in which you may perform some of the individual steps in those tests.

However, the conclusion of all our inspections in these areas have identified that the systems would respond as required and support safe operation of the plants.

MEMBER McDILL: Thank you. My question would be given what Bruce has just said, do you feel this section is written up in the best way?

If a diesel was used in refurbishment and then was retroactively qualified, it sounds as if they have been deficient, but in fact I'm not sure there's a deficiency, it's more of a proactive decision to do something that's good as opposed to a bad decision to purchase an unqualified generator.

MR. LAFRENIÈRE: So Ken Lafrenière, for the record.

I take your point. We can improve upon our messaging. The way we discuss these things really is -- we try and give the Commission enough information and we usually add a sentence about the safety significance of the issue.

It's difficult in the limited amount of space we have in the CMD to get into the details necessary to perhaps answer all of your questions, but we certainly can improve in our messaging, there's no doubt about it.

MEMBER McDILL: It's more on how someone from outside is going to look at it; right, not necessarily how I would look at it or any of my colleagues would look at it, certainly not the way

Bruce would look at it.

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

Yes, we take perhaps for granted some knowledge and background in the design of these complicated machines and we can improve upon the language, yes.

THE PRESIDENT: Thank you. Ms Velshi...?

MEMBER VELSHI: Thank you.

Question around asset management reliability. Is there a way for you to assess what percentage of the original equipment has been replaced over the life of the plant, like how much of it is really there from day one?

MR. NEWMAN: Gary Newman, for the record.

Is there a way? Yes, you probably could. By replace, we replace components on a very frequent basis when they come to the end of their life, not everything is designed for a 30-year or 60-year life.

I don't think we've done such a study, to be honest. We're more looking at system and component health, making sure that they're fit for

duty and can still deliver, you know, whatever duty, cycle requirement they have.

MEMBER VELSHI: Okay. I was just trying to get a sense of how much of it is really old and, you know, how much of it has been replaced.

So we talked about the unit 8 steam generators and issues around that. And I see in the submission there seems to be a distinction made between refurbishment and major component replacement, and I don't know, I'm missing the nuance.

But over the five-year licensing period, do you anticipate replacing any major components and maybe you can shed some light on the distinction between major component replacement and refurbishment?

MR. HAWTHORNE: Duncan Hawthorne, for the record.

Yeah, I can say we have some interest in conversations at the negotiating table about the distinction between the two, but let me explain how we would tell the difference.

Refurbishment in the past was a term related to the return-to-service of units that have been laid up, so it was refurbishment and return-to-service that became our refurbishment term.

Major component replacement for us is, in many ways we would see that as an extended outage. For units that are in operation today, they're compliant with all of the needs today and we're going in and replacing major components for extended life.

Those are, you know, pressure tubes, calandria tubes, feeders, steam generators. So it still is a very targeted set of components that have come to the end of their life and that's what we would refer to as MCR, major component replacement.

In the refurbishment, of course, these units were out-of-service for a long time, they hadn't been upgraded in the way that units that were operating were, so we had a lot of catch-up; fire protection, seismic qualification, environmental qualification. All of those things that we'd been doing on an ongoing basis on operating units had to be carried out and that was why the scope of refurbishment was a much larger activity.

So the differentiation between refurbishment and MCR is, MCR applies to units that are fully compliant today, but we've taken them offline to replace, you know, some big major components that have reached their end of life, but other than that, the units continue to operate in

compliance with modern codes and standards.

MEMBER VELSHI: So --

MR. HAWTHORNE: Sorry, I didn't answer the second part of your question.

Do we intend to replace major components over the next five years? Not as it relates to MCR. The MCR components are such that they would require, you know, the unit to be off the reactor, defueled, and so we wouldn't be -- in terms of the things that are an MCR, they would be, the ones that would do end of life.

We will be still spending hundreds of millions doing other things. As Gary said, they're ongoing investment. You know, we will replace LP rotors, turbine generator stators, large expensive items, but they would be carried out within our normal planned maintenance program.

MEMBER VELSHI: Thank you. I was going to ask staff in a regulatory space whether it makes a difference between refurbishment and major component replacement.

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

No, it's a business decision, there's no -- our oversight is strong enough.

I'll also just add what we're talking about, Mr. Hawthorne mentioned, for instance, steam generators. We currently have a strong oversight on steam generators, we make them go inspect all the tubes at a frequency, they have a periodic inspection program, we have limits in place for tube leaks which we have the licensee check all the time. So we're always following up.

So I don't want to give the impression that these components are degrading and they're on their last legs, they're all fit for service and they continue to be fit for service and, if not, we have the regulatory authority to take action to make sure that there are compensatory measures in place.

MEMBER VELSHI: At the beginning Mr. Hawthorne had mentioned that the units now, is mostly just baseload are used for load management, a bit more fluctuation in the power level.

So this is a question for staff. Are there any safety implications? I mean, were the units designed for this, does it make a difference?

MR. LAFRENIÈRE: So Ken Lafreniere, for the record.

We looked at that, we've asked ourselves those very questions and the units are

designed for those and we continue to look at it.

So in terms of perhaps there might be more wear on the condenser, then you would expect, if you're passing steam via directly to the condenser, but we have looked at that and so far we have not identified any safety concerns.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Okay. Monsieur Harvey...?

MEMBER HARVEY: Nothing.

THE PRESIDENT: Dr. McEwan...?

MEMBER MCEWAN: Yes, if I may.

One of which is actually in the Licence Handbook, Part 1, page 6 of 113.

MR. HOWDEN: Six...?

MEMBER MCEWAN: Six of 113.

So the fourth paragraph down, when I read this it took me about eight goes to actually understand what it's saying.

You use the present tense and the future tense in the same subject and eventually I think I worked out that what you're saying in this paragraph is that for the upcoming licensing period there are a bunch of new requirements that we will expect to be implemented over the course of that

licensing period.

That's actually not what it says, and certainly in the first sentence I would have some difficulty in interpreting and following that.

MR. HOWDEN: So, Dr. McEwan, that's a good comment in terms of the way the LCH is laid out. One it's a draft, so this is good feedback.

MEMBER MCEWAN: Yeah.

MR. HOWDEN: I think the second thing is, is the intentions are as you described, so there's certain regulatory documents and standards that they're already meeting, they'll meet on Day 1; other ones we expect them to implement them and they have implementation plans.

One of the nuances here is, this talks about the licensing basis which has three parts to it. The *Nuclear Safety and Control Act and Regulations* are one part, the application and all the documents that have been submitted in support of that, which is quite important because Bruce Power has submitted all of the documents they tend to, they comply with today and they intend to comply with, and then the third part is the licence and the conditions that go with that.

So we will work on doing that, but your understanding is correct of the intention of this

paragraph.

MEMBER MCEWAN: Thank you.

THE PRESIDENT: So it gives me an opportunity to make a comment on your slide 29 and slide 30, which I like very much, it's one place which shows all the changes in RegDocs and the CSA.

I just think it needs some explanation, that it can be misinterpreted. So, for example, let me pick one, maybe not PSA -- well, maybe I will use PSA.

So PSA is number 5 it says it will be implemented in June 30th, if I get it right. Did I get it right? I'm looking at it diagonally. June 30th in 2019.

Gives the impression that until 2019 they will not be complying with PSA requirements, which I don't think is the intention here.

MR. HOWDEN: No. Barclay Howden speaking. So right now the PSA requirements is S-294 and which Bruce Power is compliant with and a new RegDoc is being introduced, you know, to reflect updated knowledge with the Fukushima enhancements, and so to become compliant with that there's an implementation period.

But, as of today, S-294, we are

meeting that.

THE PRESIDENT: I know. But it is more important that it is not added in other -- see, I don't know how you express it, so you don't put in new safety requirement. Complaint with the current regulation is okay. It just does not come across between the old and the new. What is the new, that is the value added of the new?

MR. HOWDEN: So I think in terms of the CMD we try to provide that value. But I agree with the presentation, it --

THE PRESIDENT: You need a footnote or some sort of description. It does not mean that -- the meaning of the new REGDOC does not take away from the compliance nowadays, if I understand what you are saying.

MR. HOWDEN: That is correct. And we stated on slide 28 that Bruce Power is compliant with current regulatory requirements.

And then we tried to explain the continuous improvement process that a licensee goes through. But also the CNSC goes through in terms of the continued documentation and updating of our regulatory regime as we gain experience and knowledge.

THE PRESIDENT: Okay. Dr. McEwan?

DR. MCEWAN: So, again, I am sorry, this is use of English. So page 2 of the executive summary of staff CMD. At the bottom paragraph below the table, "There were no serious process system failures. Risk to the public and Bruce Power workers have been kept reasonably low."

To me, that is a pejorative term; it implies that, yeah, it is okay. But is it just okay or is it actually good or well-controlled or whatever the right word is?

When I read that I thought, they have not actually done a great job.

MR. LAFRENIÈRE: Ken Lafrenière for the record.

If your question is if it is good? It is better than good. And it is above our regulatory requirements. And this is an example of as low as reasonably achievable, which is a regulatory philosophy.

MEMBER MCEWAN: No, I agree. It is just you don't say that. You just say they are okay.

MR. SAUNDERS: I prefer well below regulatory requirements myself.

--- Laughter / Rires

MEMBER MCEWAN: But do you hear what I

am...? And may I just ask one more?

On the fatigue study that Bruce spent a long time talking about, again it is interesting because it is clearly an interesting and important study, but there is a lack of information and a lack of data.

And right in the staff CMD there were references to it, but again I came away with no understanding of actually what that involved or what the output was and, more importantly, how you use that to model staff behaviour. Because you again talked several times about, you know, monitoring and changing and intervening, if required.

So it would have been helpful to have more data in both of the CMDs to sort of understand what that is.

MR. SAUNDERS: Frank Saunders, for the record.

Yes, perhaps we tried to be a little too brief on that one. But in essence, we hadn't looked at our shift schedules and how they fall into sort of the new science around fatigue management and the like, you know, since the 1990s really.

And so we were having a lot of discussion around fatigue and fitness for duty and we

decided it was appropriate just to go out and get some of the new science and have a third party come in and apply it to our schedules and look at the work schedules we work and tell us about those things. And actually look at our overall program.

So they looked first at our schedules and gave us the printouts. You know, they have computer programs now that essentially look at your schedules and give you a cognitive awareness inputs at various points in time.

And then also look at our program, as you say, around how do you monitor, whether we have the right education programs in place for our supervisors and others to make sure that they are aware and also for our other staff. And whether rest areas and some of those things were appropriate for the fatigue management.

So that is what we did. And we can give you a little better output from that. But in essence, the shift schedules all worked out fine. We looked at some critical junctures and some of the things like you have heard of. Do you have to hold people over in snowstorms for two or three days? What does that do? What is your best sequence of rest and work and so forth so that you don't fatigue people?

How do you detect when somebody is fatigued and should be replaced? What kind of actions can you take?

So it was a basic study around just fatigue and the potential impact and what our shift schedules look like in that regard.

And when you get into a situation you can't prevent for -- you know, I mean we don't get into those long hours unless something forces us into it, it is not a planned thing, how you best respond to it to make sure everybody is safe.

THE PRESIDENT: That is a very topical subject. Staff has been issuing discussion paper and working on a regulatory document on fatigue and fitness for duty.

So maybe for Part 2 we can put a little bit more elaboration about the kind of issues involved and the kind of things you do.

MR. SAUNDERS: Yes, certainly we can do that and we will certainly provide staff our feedback. And we are also working with the Conference Board of Canada on a general fatigue study across Canada in terms of workplaces and how that works looking at a number of issues there as well.

THE PRESIDENT: Thank you.

Dr. Barriault?

Mr. Tolgyesi?

MEMBER TOLGYESI: Well, I am going just small a small question, certification. According to Bruce CMD page 12, training for certification takes 2.5 or 3.5 years. According to CNSC CMD page 19 it takes 4.5 to 5.5 years. Is there a reason for this discrepancy or difference? Because it is quite large.

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

Yes, they are actually the same thing. Our numbers included station experience, and I think Bruce Power's numbers included once they started the certification program, which is two-year station experience is mandatory to enter into their program.

MEMBER TOLGYESI: And my last one, Mr. President, is that each Bruce A and B, they carry nuclear liability insurance of \$75 million.

What will happen in the case of an incident with costs over \$75 million?

MR. HAWTHORNE: For the record, Duncan Hawthorne.

You may be aware that right now there is a bill going through the government to raise that to \$1 billion. We have actually provided evidence in support of that change.

Now, this bill has died four times on the operating table, as the government have changed them five times, and maybe six if they don't hurry up.
 --- Laughter / Rires

MR. HAWTHORNE: But we have supported that. We expect it will move to \$1 billion. We expect that will happen this year sometime. We are making the necessary arrangements to cover that through insurance and other things. But for the moment, \$75 million, everyone acknowledges is an out-of-date number, and we expect it to change shortly.

MEMBER TOLGYESI: Okay, thank you.

THE PRESIDENT: Okay. Maybe we have about a half an hour, one question per round.

Dr. McDill?

MEMBER McDILL: Thank you. There was a substantial delay in bringing this renewal forward, six months give or take.

Question to both Bruce and staff, was it enough time? Particularly with respect to staff, was there a pressure to prepare all the documentation in time?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

The project manager for the assembling of all of this information is Agnes Robert who is sitting beside me. I can say that she worked long hours and appreciated the delay. These are complicated we put together using lots of references. It involves basically all of the CNSC staff. So at one point the CMD probably went through 200-300 staff reviews.

So we appreciated the delay. I think we did a very good job. I think the whole project team did a good job and we tried to put the information together as clearly as possible.

Agnes, would you want to add anything?

--- Laughter / Rires

MR. LAFRENIÈRE: I don't think she wants to add anything.

THE PRESIDENT: I was going to ask you, Agnes, whether you agree with him?

--- Laughter / Rires

MS ROBERT: Agnes Robert, for the record.

Yes, I agree; long hours, hard work, a lot of input from a lot of people, but we got here.

MR. JAMMAL: Ramzi Jammal, for the record.

To answer your question is, yes, a lot of work and we cannot be silent on Ms Robert's dedication.

However, there are two elements for the delay. We wanted to make sure that the information in support of the application has been submitted, so for us to provide you, the Commission, with as complete as can be with respect to our recommendations to you. We do not want to go between Part 1, Part 2 with major outstanding issues.

So the pressure was on us to put pressure on Bruce in order to submit the required information. And that is why I think, if I may take the floor, where there are allegations by Greenpeace that the applicant is in noncompliance, we take such allegations very very seriously, I personally do.

And it doesn't matter if it is an allegation against a nuclear power plant or a single source, I respect the fact that the Commission is allowing us time to respond for Part 2 in detail. But the allegations being presented are not founded or justified.

So for Part 2 we will provide the details, but I want to put the record straight with respect to the fact that if they are in noncompliance,

we will not proceed with recommendations for relicensing, and it doesn't matter if it is a single source or a nuclear power plant.

MEMBER McDILL: Thank you.

Bruce?

MR. HAWTHORNE: We were ready months ago, I don't know what was taking so long.

--- Laughter / Rires

THE PRESIDENT: Frank, do you agree?

--- Laughter / Rires

MR. HAWTHORNE: So obviously there is a tremendous amount of information in this application and, you know, I have a lot of regard for the people who put it together. Because I know we have talked today about, you know, maybe that was a bit of ways to have said things, but there is a tremendous amount of data goes into this.

And quite honestly, it is one of those projects that even if you add six months more you would still be rushing at the end because it is a very dynamic situation and you want to give as complete a story as you can.

Actually, I think this team has worked well because we have been able to complete 2014 and look back on a full year. So I think the timing -- I

don't think anyone has crammed stuff in and not done a proper job because the hearing date has come up. If that was a concern, I think Ramzi...

But regardless, this is a big site, it is a big licence, there is a lot of activity and there will always be a lot of data and it will all come together to meet a hearing date.

THE PRESIDENT: Ms Velshi?

MEMBER VELSHI: Question for Bruce Power on Staff CMD page 48. This is on predicting future unavailability of systems.

And so it is the third paragraph from the top, where for two systems the model came that wouldn't meet the availability target.

And I think it is a criticism that we have heard of before. That if the model doesn't give the numbers that we like or that you like, then which it is supposed to then say here are the fixes to make sure that the availability gets better, we actually then go and refine the model so that the output is better.

Can you comment on that please, Bruce Power?

MR. CLEWETT: Len Clewett, for the record.

So one of the things we ask our system engineers to do is not only look at lagging data, but look at proactive data. So in this case with safety systems which are -- some are, you know, our highest monitor systems they look at surveillance data, preventative maintenance data, that type of thing. And they look proactively to see if we are going to need to do any extensive re-engineering or replacement in our project.

So it is I think a step that we wouldn't have talked about 10 years ago in the industry. But now we are proactively looking ahead to keep these systems' unavailability as low as possible.

MEMBER VELSHI: So is it my reading then of this that I am not getting it quite...? Because what I am getting is, yes, you do look at all of that and out comes the unavailability prediction. But the number didn't meet the target, so then you go back and revise the model so that the result is acceptable.

Why don't I get staff to comment on because it is their submission?

MR. HAWTHORNE: Maybe I can explain a bit following what Len said. We take a view of the actual performance of the equipment and we predict

what its unavailability might look like. So when we talk about updating the data, what we mean is by adding actual data on reliability and then reshooting the unreliability model based on actual reliability.

So we are not actually playing around. We are not pencil whipping an issue away. We are updating it with real operational data and then feeding that into the model and saying, does the actual performance indicate a definite outcome?

And in this case, we have been overly conservative about the performance of the equipment and actual service, and that is where this difference comes up.

MR. CLEWETT: Len Clewett, for the record.

It is actually, in this case, a restoration time to restore equipment that actually was incorrect previously, and that is what changed it.

MEMBER VELSHI: Staff, anything to add?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

I am going to ask my site officer to add to it. But basically, these are forward-looking indicators. You are absolutely correct, if we do find

an issue with it, they go and correct actual equipment; testing frequencies, monitoring frequencies, or they might update the model, depending on what the issue is.

Jeff Stevenson will add further details to that.

THE PRESIDENT: I am trying to get as many questions in the last 20 minutes as we can.

Monsieur Harvey?

Dr. McEwan?

MEMBER MCEWAN: So in the environmental assessment information report a couple of questions, one just for my interest. But the other is in 4.1.2.1 on page 21 you define critical groups. And then you define those groups in Table 4.5, and then in Table 4.6 you give estimated dose to the public. But it is not obvious to me that there are data related specifically back to those groups.

It seems to me it would be helpful if you would define the groups at the beginning to provide data specific to those groups. That would at least help us understand why you have defined them in the first place.

MR. LAFRENIÈRE: So I will ask Kiza Francis to add to my answer.

But this monitoring program, which is the dose impact from the releases from the station, these groups are identified by CSA Standards, which is a licence requirement.

I will ask Kiza to explain exactly how they end up identifying these groups.

MEMBER MCEWAN: You identify the groups, but you present no data.

MR. SAUNDERS: Frank Saunders, just to clarify.

These groups are actually chosen within our area and it is really based upon a CSA standard. And you are looking within the 10 km zone, generally speaking, and you are picking out families of different ages and so forth and deciding which ones are the most sensitive to the danger.

So they are picked in advance and we sample related to those groups and we provide data related to those groups as well, right? So the groups are well defined, they are defined in advance, we know who they are and where they are.

And then we confirm with our program that in reality the results make sense in terms of those groups, right?

UNIDENTIFIED SPEAKER: (off

microphone)

MR. SAUNDERS: Yes, well we can do that for you. It is quite a long report, it is on our website, but we can do that.

THE PRESIDENT: Okay. I see some hands waving. Go ahead.

MS FRANCIS: Kiza Francis, for the record.

So the data is Bruce Power's data and it is taken from their environmental monitoring program report, which we have referenced in the EA under the *Nuclear Safety and Control Act* report. So the purpose of our report was to provide as much information about the environment and how Bruce Power's program is protective of the environment, in a small package.

So further information on data for those groups is in the report provided by Bruce Power. But for Part 2, absolutely we can provide more information on that.

MEMBER MCEWAN: Just out of pure interest, why is there a two order of magnitude difference between the allowable or the guideline for Cesium-137 between fish, beef and pork? There is a huge level in their allowable levels. Sorry, page 31,

the table.

THE PRESIDENT: That is a lengthy conversation on those.

MEMBER MCEWAN: I am sure it is.

If somebody could tell me offline, I would be interested. But it is just such stark difference.

MS FRANCIS: I am sorry, can you just help me identify where you are in the table?

MEMBER MCEWAN: Well, if you take beef and pork, Cesium-137 for the two, the guideline for Cesium is 3360 Bq/kg, and for pork it is 13.6.

THE PRESIDENT: Can I suggest that for Part 2, you should be able to answer -- I also would like some discussion about the guidelines themselves. Some of those numbers like, I don't know, for tritium of 488,000 et cetera. I am trying to understand. There is hardly any relationship between the guidelines and the actual numbers.

So, you know, we always get into this debate where the guidelines are too permissive or not, just a --

MS FRANCIS: Kiza Francis, for the record.

Absolutely, for Part 2 we will clarify

the guidelines. You should note on footnote 1 how the CNSC-derived reference levels to represent the concentration required in a given media for a member of the public to receive an effective whole-body dose of 0.1 mSv per year due to the exposure of the given radionuclides.

So some of these are CNSC-derived, but we can definitely provide further information on Part 2.

THE PRESIDENT: Okay. And obviously the differences between different types of meat doesn't make sense, so somebody will explain to us.

Moving down the list here. Dr. Barriault? Mr. Tolgyesi?

Okay, I am going to take an opportunity to ask a couple of questions. First of all a generic question. Where the aging of the facilities, is CNSC planning different types of inspections, different frequencies of inspections that are more defined by risk rather than routine? In other words, as you get closer and closer down the aging line, are you changing your inspections?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

The answer is yes, we have a

risk-informed baseline inspection program. And part of that inspection program is a reactive component.

If we see the degradation in inspections, we will increase the frequency to adopt to whatever issue is causing it, whether it is aging or equipment maintenance or so on. But we do increase our frequencies of inspection reactively to issues.

THE PRESIDENT: Thank you.

On your slide 31 on the severe accident management, I don't understand the issue. You are making a specific recommendation to include CNSC REGDOC 2.3, accident management. What is the story here? I thought all our licensees were to come up with SAMG-type processes that should be in place. I thought they were even part of Fukushima. Somebody clue me in. What is going on here?

MR. HOWDEN: Barclay Howden, for the record.

You may recall when this document was put in place there was a lot of concerns raised by the industry. And the Commission directed ourselves, the CNSC staff, to hold a workshop with industry to discuss the concerns around the implementation of this document and the compliance verification criteria needed for this.

So we had a workshop with all of industry on January 20 of this year. And in the course of the meeting they raised 22 concerns over various things. And so we are in the process now of reviewing those concerns and the discussions, and with feedback to the industry on February 20th is planned.

The intention of this is we want to make sure that when these documents go into being in place that the industry is able to put together an implementation plan to meet, but at this point that isn't the case.

So we do have an Accident Management document already in place, of 2013. So we're saying that one should remain in place until we sort through this process and when we do then we can add to the Licence Conditions Handbook the compliance verification criteria.

Just to let you know, in those discussions I think we clarified quite a few issues and Mr. Saunders may want to comment because a lot of it was over the interpretation of what things meant and what the compliance verification criteria would be.

So I think we were actually closer together at the end of the day than when we started the day. But we have a path forward and we expect in the next few months we'll be able to determine what compliance verification criteria will be required and what kind of

implementation strategy the licensees can put in place.

THE PRESIDENT: I'm still -- something doesn't compute. I thought post-Fukushima the whole emphasis was on severe accident management, beyond-design management. So I don't want you to repeat all the 22 issues but I thought that the whole Fukushima plan was to deal with severe accidents. What am I missing?

MR. HOWDEN: That is correct. And in terms of severe accident management program, they do have that in, including their Fukushima guidelines.

MR. SAUNDERS: Frank Saunders.

From a Bruce Power perspective, if you recall, we came in front of the Commission when that document came forward. The issue wasn't whether we have these things in place. Our issue was that the document itself did not describe what we had spent the last four years building, and as we've been pointed out here by the Commission all afternoon, words matter in this jurisdiction. So if you get the words wrong, regardless of what you intend, somebody will come and hold you accountable for it.

So that was our view, is that the words needed to be fixed so that they reflect what we actually did. We have very robust programs in place now both in severe accident management and emergency response generally

and we just really wanted this document to line up with all that work that was done and explicitly state it the right way.

I don't disagree that the intent to staff was actually exactly what we did but the words, in our view, didn't match the intent and that was the problem. If we put the wrong words in the public domain, sooner or later somebody will challenge us as to why we don't meet those words, right?

So that was the concern and that was what we discussed. It really wasn't whether we needed to do something different. It was really more of aligning the documents to match up to the way we had progressed on this.

THE PRESIDENT: Okay. Thank you.

Another question. I understand that now staff has deemed the emergency centre to be okay. I have a question that came to us recently.

There was a study in the States that recommended that you guys should be connected to us also electronically. Since you set up a new emergency centre off of the control, I assume it's electronically controlled. How about extending some connectivity to CNSC? What do you think about that idea?

MR. SAUNDERS: Yeah. Well, in fact, you know that I was keen to extend connectivity because I

really want to get away from fax machines and all the bits that go with it and certainly that's what we're doing with the offsite monitors.

There is an issue with the plant information system, which was what your staff proposed that we use. We don't have a qualified system, a plant information system. You can't use it in an emergency to read data because it's not designed for that. It doesn't have any EQ'd systems and you can't verify that's the data.

So what we suggested to staff was tell us what you think CNSC wants to know, what parameters you want to read, and we will look and try to find a way that we can communicate that to you other than having you call us up and say what it is.

So we have no objection to the automatic transfer of info but the plant information systems in Canada, even though they're built kind of on the same framework, are much different.

The U.S. plants were designed with these as QA'd quality systems in the first place. They actually use the data in their control rooms and other places.

Ours are built actually as data storage. So they don't -- they're not a QC'd system, so you could not use them in an accident to determine data. They wouldn't -- the data might be wrong.

So it's just -- you would either have to QC that system, which would be hugely expensive or find alternate means, which is the way we actually do it in the plant.

We have instrumentation that we rely on in severe accidents. That instrumentation is QC'd and controlled and we have ways of getting at it. It's not actually currently set up to sort of automatically transfer data but there are things that we can look at doing.

THE PRESIDENT: Well, I'm puzzled because I thought there's a government-wide secure network that is connected across the country and you can -- in fact, I think somehow we allow you guys to connect to it and I think we can use this as a vehicle for connection.

Mr. Raoul, you want to say something on that?

MR. SAUNDERS: Yes. It's not actually the government network that's the issue. The suggestion was what's the source of the data, right, and the source of the data that was being suggested by staff was a thing that we call the plant information system. It's a computer system that stores data in our plants. But that system is not qualified for emergency use. It's not even qualified for process control. So it is not the right data to provide to people that are making the decision. It's not its purpose

in life.

So, like I say, the question is what data makes sense for you, what data do you like, and let us look at how we can deliver that data to you. But the plant information system would not serve that purpose.

THE PRESIDENT: Okay. Not to belabour the point. I think fax is not acceptable nowadays. I think we can do better than fax. So I would look forward to some solution that will bring us to the 19th century -- 20th century.

I just want to also hear -- I think that you agreed to do the OSART. This is the operational safety assessment. I guess everybody is committed to this. Canada is now prepared to host with you -- we haven't done an OSART in Canada for a long, long time. Hopefully, you can extract some valuable information out of this. I'm not sure you guys were fans of IAEA doing this as opposed to WANO and INPO. Any views on the outcome?

MR. HAWTHORNE: Yes. Duncan Hawthorne for the record.

Yes, we are excited about OSART. I've been involved in OSART in Europe many times before, so I know the process well, both as an evaluator and as someone who was subjected to it. So yes, I think it is a good process.

The good thing about it is it's very public, so it helps a lot in terms of, you know, the public getting a bit of comfort. Obviously, we're talked before here about a WANO review and the confidential nature of the findings from a WANO review. So the thing that OSART has going for it is the fact that it does afford the opportunity for public disclosure and so that has to be a positive.

On the other hand, we, WANO, if I can wear a WANO hat for a moment, do not see OSART as being equivalent to a WANO review. So, although the site will go through an OSART review, it will not be able to claim that as a replacement for a WANO review. And that's fine. I'm comfortable with that too because WANO reviews are intended to be highly critical and provided to the plant manager for ultimate safety goals. They're not intended to be a public communiqué because we personally believe that undermines the quality of the review.

So we're happy to participate in both. We think it's a chance for people to see some of the Canadian plants. As you mentioned, Dr. Binder, they haven't been before. I'm not sure they have ever been, and if they have it was a very long time ago under entirely different circumstances. So we look forward to hosting the review in October of this year.

THE PRESIDENT: Thank you.

My last question is I'm still fascinated with your outreach program. You have 17,000 people online. That's amazing and I'm trying to figure out whether CNSC can use or OPG can use something similar during hearings. I'm not sure that our webcast draws that many people. I don't know if I can count it but it would be nice to be able to count how many people are actually listening to this kind of webcast.

MR. HAWTHORNE: Yeah. Obviously, it is a very large number. I was shocked. I think it's the Sean Connery accent that does it for me.

--- Laughter

MR. HAWTHORNE: But, you know, obviously there are a lot of people interested in what we do there. But I myself was surprised at so many.

We're using an infrastructure, quite frankly, that political parties use a lot in terms of getting our message out. So it's not a new technology, it's just a new approach for us.

And as I said, you know, there's no way we could ever get that kind of outreach by having, you know, traditional town halls. We have to find a new way to get our message out.

THE PRESIDENT: So you mean when we come

to Part 2 and you're going to be there, you're not going to draw 17,000?

--- Laughter

MR. HAWTHORNE: No, I'm not expecting that but I think I would prepare for a lively and active group of interveners and, you know, for a change maybe they won't all be negative.

But I think you can expect -- our community is very knowledgeable because we are the largest employer and so our employees are the community or their relatives are the community, and all of them actively participate in everything we do. So I think this Commission might be pleasantly surprised by how many people do engage themselves in the hearings.

THE PRESIDENT: Thank you.

Okay, last one, Dr. McDill?

Ms Velshi?

Monsieur Harvey?

Dr. McEwan?

Dr. Barriault?

Monsieur Tolgyesi?

Okay. Well, thank you. Thank you very much and we are on time for a change. Thank you.

MR. LEBLANC: The hearing is to be continued with Part 2 on April 14, 15, 16, 2015 at the

Royal Canadian Legion in Kincardine.

The public is invited to participate either by oral presentation or written submission on hearing Part 2.

Persons who wish to intervene must file their submissions by March 16, 2015.

If you did borrow interpretation devices, remember to return them at the reception and claim your identification card.

Bonne journée. Safe travels.

--- Whereupon the hearing concluded at 3:59 p.m. /

L'audience s'est terminée à 15 h 59