

Canadian Nuclear  
Safety Commission

Commission canadienne de  
sûreté nucléaire

Public hearing

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Le 13 avril 2015

Davidson Centre  
Kincardine Hall  
601 Dunham Street  
Kincardine, Ontario

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601, rue Dunham  
Kincardine (Ontario)

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Dr. Moyra McDill  
Mr. Dan Tolgyesi  
Dr. Sandy McEwan  
Ms Rumina Velshi  
Dr. Ronald Barriault

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Secrétaire:

Mr. Marc Leblanc

M. Marc Leblanc

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Avocate générale :

Ms Lisa Thiele

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Kincardine, Ontario

--- Upon commencing on Monday, April 13, 2015  
at 6:34 p.m. / L'audience débute le lundi  
13 avril 2015 à 18 h 34

### **Opening Remarks**

**MR. LEBLANC:** Good evening, ladies and gentlemen. Bonjour à vous tous. Welcome to the public hearing of the Canadian Nuclear Safety Commission.

The Canadian Nuclear Safety Commission is about to start Part 2 of the public hearing on the application by Bruce Power for the renewal and consolidation into a single operating licence of the Nuclear Power Reactor Operating Licences for the Bruce A and B Nuclear Generating Stations.

During today's business, we have simultaneous translation in English and French. Des appareils de traduction sont disponibles à la réception. La version française est au poste 2 and the English version is on channel 1. We would ask you to please keep the pace of your speech relatively slow so that the translators have a chance to keep up.

L'audience est enregistrée et transcrite textuellement. The transcriptions are in the language used by the participants.

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

The transcripts will be available on the website of the Commission in about 10 days. 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, présidera l'audience publique d'aujourd'hui.

Mr. President.

**THE PRESIDENT:** Thank you, Marc.

Good evening, everybody.

First of all, on behalf of the Commission, I would like to tell you how delighted we are to be here today, outside of Ottawa, in your community, a beautiful community. We haven't seen much of it yet, but I guess in the next three days we're hoping to see more of it. So we thank all of you who are welcoming us in the hotel and all the staff who have prepared this particular facility. It looks really nice.

I would like to start by welcoming everybody who is here in the conference room and those who are joining us via the webcast and through teleconference.

My name is Michael Binder, I am the President of the Canadian Nuclear Safety Commission.

Let me start by introducing the Commissioners who are with us today.

We have, on my right, Dr. Moyra McDill and Mr. Dan Tolgyesi; on my left are Dr. Sandy McEwan, Ms Rumina Velshi and Dr. Ronald Barriault.

We already heard from our Secretary Marc Leblanc and we also have Ms Lisa Thiele, Senior General Counsel to the Commission.

#### **CMD 15-H3.A**

#### **Adoption of Agenda**

**THE PRESIDENT:** So I would like to start by calling for the adoption of the agenda by the Commission Members, as outlined in CMD 15-H3.A.

Do we have concurrence?

So, for the record, the agenda is adopted.

Marc, you have some opening remarks?

**MR. LEBLANC:** Thank you.

As mentioned earlier, this is Part 2 of

the public hearing. The first part of the public hearing on this application was held on February 5, 2015 in Ottawa. The Notice of Public Hearing 2015-H-01 was published on December 1st, 2014 and a revised notice was published on March 23rd of this year to add this evening to the agenda and also announce the change of location for the hearing.

Presentations were made on Part 1 of the hearing by the applicant, Bruce Power, under Commission Member Documents -- I will refer to them as CMDs -- 15-H2.1 and 15-H2.1A, and by Commission staff under CMD 15-H2 and 15-H2.A. CNSC Staff filed a supplementary submission on February 27, CMD 15-H2.B, and it was made available to participants on March 2.

The public was invited to participate either by oral presentation or written submission. March 16 was the deadline set for filing by intervenors. The Commission received 146 requests for intervention. Two requests were received significantly after the deadline and were denied.

April 7 was the deadline for filing of supplementary information. I note that supplementary submissions and presentations have been filed by CNSC staff, Bruce Power and several intervenors. These documents are available at the reception either on CDs or in paper format, as well as the Commission Members'



biographies.

Participant funding was available to intervenors to prepare for and participate in Hearing Part 2. Ten groups or individuals are receiving funding and they will be making presentations in the context of this hearing. The funding decision is available on the CNSC website.

In terms of logistics, we will first hear the presentations this evening by Bruce and CNSC staff.

This will be followed by the -- we will go through some written submissions that have been filed; there's a number of them.

The Members have decided at this juncture that they will not have a round of questions this evening. Instead, we will wait for those questions in the context of the interventions that are done.

The presentations by the intervenors will begin tomorrow morning at 8:30 a.m. and will follow the order listed on the agenda.

We've tried to assist the intervenors by providing some general time slots either in the morning, afternoon or evening, and this will be the same thing with respect to the three days.

Time permitting, the Commission will also review written submissions at the end of each day,

including this evening, as I just mentioned. These written submissions have already been read by the Commission Members and we will address each of them before the close of this hearing.

Fifty-eight intervenors are scheduled to present orally this week. While the presentations are limited to 10 minutes each, Commission Members will have the opportunity to ask questions after each presentation. There is no time limit ascribed to the question period.

We have also tried very generally to group interventions by themes. Tomorrow, the general theme is on the environment; on Wednesday, it will be more on technical issues, aging PRAs; and on Thursday, it's on emergency preparedness and health.

This being said, it's not a perfect grouping but we've tried to do so to facilitate the participation by other government departments who may have an interest in those matters.

Your key contact persons here will be Louise Levert and Johanne Villeneuve from the Secretariat staff, who you have already probably met. They will be at the back desk and you will see them going around or at the back of the room if you need information regarding the timing of presentations, et cetera.

Mr. President.

**THE PRESIDENT:** Thank you, Marc.

So now, we have the distinct honour to welcome an elder from the Saugeen Ojibway Nation who had kindly accepted to grace our proceeding with an opening prayer and I understand that this will be done by Chief Root. If you please.

**CHIEF ROOTE:** First of all, welcome to the Territory of the Saugeen Ojibway Nation.

My name is -- my English name is Vernon Roote and my Anishinaabe name is (Aboriginal language spoken).

I wish to do a prayer for everyone so that everybody can have a full understanding of the Territory that they're in and responsibilities within the Territory.

I brought a Wampum Belt with me that symbolizes the responsibility of the Treaty Land that we all sit in at this point in time. This Treaty Land has got a lot of responsibilities and those who are involved with the operations within the Treaty Land also have lots of responsibilities.

With the government of the day when the Treaty was made of this country, there was many considerations of protection and stewardship of the land, and so with that basic understanding the Treaty was made.

And at that time -- in my language --

--- Aboriginal language spoken

It is with this understanding of our people of the responsibilities that sit with everyone here of this land, an agreement was made with the Treaty and that Treaty had two signatories to it. One was of course ourselves and the other the government of the day. The responsibilities that stem from that era to now still stand.

It is through the responsibilities that are within the Wampum that we remember those responsibilities. If people want to break the Treaty of the land, the negotiations can start. If you wish to break the Treaty, the responsibilities of stewardship of course are here.

And so I'd like to now do a prayer because that is our custom and our tradition of this Territory, as with you because you also share that responsibility with me. That responsibility is accountable to God. We are accountable to God and in my language, the word "God" is pronounced (Aboriginal language spoken).

And so, at this point I ask that you join me with a prayer so that the proceedings here can go well from the world of the spirit who was once here and is still here to watch over the land as well as watch over the people that look after the land.

--- Prayer in aboriginal language /

Prière en langue autochtone

**THE PRESIDENT:** Thank you very much, Chief, for wishing us success in this proceeding. We share your view that we would like success in this particular proceeding, so thank you for being here and sharing with us and your prayer.

**CMD 15-H2.1B/15-H2.1C/15-H2.1D**

**Oral presentation by Bruce Power Inc.**

**THE PRESIDENT:** I would like now to formally start the hearing by calling on the presentation from Bruce Power as outlined in Commission Member Document 15-H2.1B, C and D. I understand that Mr. Duncan Hawthorne will make the presentation.

Mr. Hawthorne, please proceed.

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

For the record, my name is Duncan Hawthorne, I am the President and Chief Executive Officer of Bruce Power. First, let me say I greatly appreciate the Commission being here in our community. I think this is a very important part of the whole regulatory process that people in our community have the chance to see the workings

of the Commission.

I'm sure as we go through these next few days together you will see a community that is very engaged in the activities of our site and a very diverse range of interventions, but on the whole very knowledgeable about our activities. So, as I suspected would be the case, a lot of interest in what we do on the site and, you know, the whole process is enriched by that. So we are very happy to see this process run.

I also want to thank the Chief for being here. And part of his words, although I didn't understand them all, as you might expect, I know the great respect with which the Saugeen Ojibway treat the land and I would like to think that we do our very best to meet the expectations and standards that they have. So I don't -- you know, I have always believed that we have a position of mutual respect for each other.

You know, when Chief Kahgee was the chief we talked often about me being a good neighbour and he said, "You are not a neighbour. You are a tenant" and so I always remembered that quote. I say it often and so any comments I make in the future are with the respect due for the Saugeen Ojibway's traditional rights. So I thought it worth mentioning that in the beginning.

As we mentioned, and was mentioned by the

Secretary, at Day One hearings we provided very comprehensive information to the Commission Staff so I won't draw the proceedings out other than to say that in our supplemental position we sought to amplify some questions that were asked by the Commission, provide some more material to assist the Commission in its deliberations and also to flesh out some of the points that are in evidence in some of the interventions. These are really the supplemental things we want to talk about.

Firstly, Mr. Saunders -- the Commission are well aware of our VP of Regulatory Affairs -- will speak to our Fukushima upgrades.

Gary Newman, our Senior Vice President and Chief Engineer, will speak to some of the activities related to PSA.

I should also say that with us this evening is also Len Clewett, our Executive Vice President and Chief Nuclear Officer.

So for the purpose of keeping the Commission hearings on track, I would like to hand over now to Mr. Saunders to discuss Fukushima updates.

Thank you.

**MR. SAUNDERS:** Good evening. Frank Saunders, for the record.

I will just see whether I can get this

presentation up as well as I should. Oh, there we go.

So as it has been our practice since Fukushima, really starting in 2012, each year we have made a video that kind of documents the progress we have made in installing the equipment and the new material.

What you are about to see tonight is the basis for what that video will be this year. Unfortunately you get to listen to me stumble through it a little bit rather than quite as slick as it will be in the video in a month or so, but I think it does a very good job of showing the progress that we have been able to make over the last three or four years and it's fairly substantial, especially when you consider in our field it takes a little while to make changes because of the rigour with which we do it. So with that I will move into this.

So the CANDU are designed and nuclear plants in general are designed to be pretty safe. They have a lot of redundancy and diversity built in their systems and we will talk just a little bit about that at the front end.

--- Video presentation / Présentation vidéo

**MR. SAUNDERS:** So this is the way that plants have been designed traditionally and they have been very safe over the years. But Fukushima brought upon a new concept in that, you know, the plants were self-contained,



they had many levels of redundancy and backup power, and so forth.

Fukushima demonstrated that perhaps in some circumstances a situation could arise which would actually disable all of that because it's all in one place and the event of Fukushima was a very significant event not likely to happen on a very high frequency, but still some level of possibility. So the challenge then became how to prepare for this type of event which is of high consequence but very low probability.

In this area of course we have a couple of things that do happen in some frequency. You have seen the ice storm and this is a picture of the Goderich tornado from a few years ago, an F-3 type tornado that was just sort of 50 kilometres south of here.

So we looked at an enhanced emergency response approach that would allow us to provide even a broader level of diversity into our protective systems and we wanted to add some additional layers to defence, primarily aiming at the two things that a nuclear facility needs most of all, which is backup power and cooling water.

So emergency makeup water we looked at in a number of different places and this just illustrates the changes we have been making and what they look like.

If you look at the model of the reactor,

which I have next, you will see the reactor itself in the centre with the, you know, darker colour representing the hot fluid from the reactor circulating through the steam generators on top.

In our reactors of course there are four steam generators on each side, so a total of eight per unit. And that hot water from the reactor boils the water in the steam generator and produces steam.

In normal operating mode, that is the way it works. If you should lose heat sink through the turbine, then the large relief valves on the top will lift in order to relieve the steamed atmosphere and cool and depressurize the heat transport system.

In an emergency situation this is exactly what you want to happen. And you don't require any pumps, the heat transport system will circulate naturally; cool water up at the top and the reactor at the bottom, and it will cool and the fluid will circulate with no pumps and no power.

To make this happen, you need a few things to be done though. Number one, you need the boiler steam valves to be open so that there is somewhere for the water to go so it steams off the steam.

Now, there are different ways you can do this in the plant already. What we did was add another

manual way of doing this through independent air tanks so that we are sure that we can open these valves and lock them open.

Second thing you need is water in the steam generator. So the first path to water in the steam generator is through the inner unit feedwater tie is in place. That takes 30 minutes or less to hook this up for all eight units, and that provides makeup water to the steam generators.

Not being satisfied with one, we have a second way of making up water to the steam generators which can be done through each individual unit. That takes about 90 minutes to hook up to all eight units. And the timeframe we have here is about six hours or so to do this properly.

The next thing we need to do is make sure that the heat transport stays full of water. Obviously, you know, in order for it to circulate and cool it needs to be full.

When you bring a reactor down from power and the heat transport fluid cools, it shrinks and you have to add makeup water to keep it full.

The two Bruce reactor designs actually have very unique feature, it is not seen on many reactors. We have what we call heat transport accumulators.

They are large tanks with a large bunch of water stored in them, about 625,000 litres or so, which are pressurized by nitrogen, require no pumps or sitting on the system and they will supply water to the reactor automatically when you need it, and there is more than ample supply there to keep the heat transport system full.

There are two gate valves which need to open on each unit, those are supplied from all the emergency powers on site. But we have also provided a hook-up to the generators to actually -- to the portable generators to also open these valves. They can also be opened manually as well, so there is multiple ways that we can make sure that we get the feedwater in.

The next layer of defence should all that fail and you want to keep the fuel cool is to keep the moderator full of water. The moderator is not a pressurized system, it has very large rupture discs on it. We have a number of ways of adding water. The main thing we needed there was the pump or switch, we have.

And we have our severe accident management procedures which allow us to add water today. Unit 1 and 2 have also been hooked up with a quick disconnect type of system, and I will show you what that looks like in a minute, and the other units will follow.

And finally, shield tank makeup and

protection. So the shield tank actually surrounds the moderator, it also includes the end shields. It is another set of cooling that we can use to prevent, you know, should the fuel come out of the fuel channels that prevents it from sinking down to the bottom of the vessel onto the floor.

So the shield tank makeup or protection. Makeup is again provided through the pumper trucks through a kit that we have provided and we are looking at oil pressure protection there. And we will talk about the schedule as I go through this a little farther.

And last but not least, the two fuel bays are also supplied with makeup water.

So just to give you a sense of what this looks like. These are the boiler steam relief valves. These are the manual stations that you can use to open those valves if you need to on manual, even though the station may in fact be in a blackout mode.

Emergency supplies for power and water are shown here. On the right-hand side you see what we call dry hydrants, and I will show you what those are. And the power supplies, one on each unit; one on Unit 0 and one for the emergency filtered air discharge system that is on containment.

So the source of water comes from the big

pumpers that we have on site. We have five of them now. The dry hydrants are at the tip of that arrow. We can also, just below that, you will see a dock at the outlet channel, we can also do it from there. So again, two redundant systems, two different places that we can pull the water from.

So high-capacity pumpers, 3,000 gallons per minute capability. Only requires one of them actually to feed all the boilers in the station.

These are the hydrants I talked about. These actually just a pipe that drops down into the channel, down into the lake. This operates at lake level so you are essentially drawing on the lake here. You hook them up to the suction side of the truck, quick and easy, and now you are ready to pump water out the other end.

And this just shows you how that connection point works from the truck. Connect on there and another quick connect in the station to the new unit feedwater tie and you are now ready to supply water to all the boilers in either station.

So that is the 30-minute hook-up, that particular version.

Here is a few pictures of some of the -- now looking at the individual unit hook-ups. Remember I told you there are two ways; one I just showed you at the

unit feedwater tie. This is in the units, and so there are some pictures here of how that happens.

Again, you will see the quick connects that are here. You just hook up to them and you can supply water.

Heat transport system, I talked about the accumulators. These big yellow tanks you see in the foreground here, these two are the nitrogen tanks that actually drive the water. Just in the background you can see the four other big yellow tanks that hold the water. And like I say, the 625,000 litres there ready to go.

On the top left you see the actual gate valves I talked about. You will see the manual hand wheels there, they can be opened manually. They can be opened on backup power or on battery power and they can be opened up on power from the portable generators.

All this is actually in place and operable today. And this just shows you sort of a picture of how it works.

This is the moderator makeup quick disc connects over at Bruce A on Units 1 and 2, and these will be added to the remaining six units as well. The moderator makeup and the heat transport makeup to the quick disconnects, that begins happening with unit outages in 2016; three of them in 2016, three in 2017, and the last

two in 2018. That will be the moderator and the heat transport makeup connections.

Meanwhile, we do have the SAMG process that we can use to hook-up manually. The quick connects are meant to be physically diverse, provide a second way of doing it that is different from the first way of doing it, and provide a faster way.

Although in truth, in the analysis neither the moderator needs -- the moderator does not need to be done in a short period of time. You have time on the moderator system.

And these are the fuel bays, so we have a primary fuel bay at each station and a secondary fuel bay, the secondary fuel bay on the left. You will see the hook-up there outside and the primary fuel bay, the hook-up on the inside. Again, the very same hook-up, just a quick disconnect for the fire trucks to hook to.

--- Video presentation / Présentation vidéo

**MR. SAUNDERS:** And now to talk a little bit about emergency power. Again, all the philosophy here is with quick, simple connections with material and equipment that the staff are used to using.

So the first thing we should point out is we have a fair amount of redundancy in backup power. We have four standby generators and two emergency power



generators at each station. Although the emergency power generators are called qualified power supply at Bruce A; different name, but same system.

--- Video presentation / Présentation vidéo

**MR. SAUNDERS:** So you see here a few of the tractors and other things in our storage building that we use for this equipment.

So a few pictures to show you. This is the Bruce B side, the 100 kilowatt generator plus the hook-up that -- this is one of the units, I am sure which one, I can't quite read the sign. These are all marked inside the station, so you can't misread them.

And the doors leading in from the outside are marked to lead the teams in the right door to do this so that they don't have to fumble around in an emergency doing it.

Again, these are the 700 kilowatt generators. There is a redundant generator there; there are only six required, and we have an extra.

This is them being deployed. I think this was actually Huron Challenge.

This is at Bruce A side. The electrical system at Bruce A is a little different design, so we have a 400 kilowatt generator there, and this is it hooked up over at Bruce A. This is back at Bruce B with one of them

again. The quick connects from the generator itself, pretty straightforward.

And on the left here you see the Bruce A connection and on the right you see the Bruce B connection. They are slightly different systems, so they had to have a slightly different hook-up in them, but that was done on purpose.

The other thing of course is this was a lot of new equipment and a lot of new operating skills that hadn't existed exactly before. So we needed to do the task analysis and develop the training and take people through the qualifications and then invent some new qualifications to do that, and that has been done.

We are still looking at the systematic approach to training on the broader ERO skills, the guys that are in the emergency management centres and the like, and there is still some work ongoing. But all of the emergency response personnel have been through this and had this training and have done it many times now.

And we haven't forgotten about one of the key risks. I mean, there are some dangers sometimes when you get looking at the exotic risks; the tornadoes, and the big -- that you forget about the sort of day to day things that are problematic. And the one that is probably the biggest risk for us and I think is probably the biggest

risk for any building or any house is actually fire. And so we haven't forgotten about that.

We've been doing a lot of work on this as well both because it's a risk day-to-day and of course in a catastrophe when things go wrong and tornadoes go through, sometimes things catch fire. So we've done a fair amount of work in this regard.

In fact, we were just this morning doing the grand opening on the fire training facility and these are a couple of the pictures. This isn't really the plant that's burning here. These are mock-ups in the fire training facility. It's a five-storey building.

As you can see, a nice big turbine generator set that people take a lot of joy in lighting the fire. This is a cable tray, a very standard thing in the plant. And here is a heat transport pump. So you get an idea of this.

We have 11 what we call design basis fires in the plant and they're all here, along with a number of external fires like vehicles and other things that we might have to fight as well as some pans that we can use to train on the foam as well.

So having all the equipment is great and making sure we know how to use it is great. We also need to know how to work together and coordinate the activity.

Huron Challenge was a big exercise in that regard for us to test it out and next year we will do another major exercise to work through this.

I have a couple of little clips here from Huron Challenge, I think, which help to show how it works.

--- Video Presentation

**MR. SAUNDERS:** And of course during Huron Challenge, the other side is what's going on out in the community and how you support that and make sure that the equipment is there.

These are a few pictures:

- Canadian Red Cross.
- A Health Canada copter doing radiation surveys over the site.
- The OPP doing a rescue up in Port Elgin. Some students who were happy enough to play casualties for us and test out the hospital facilities. They seem to enjoy this sort of thing.
- The Emergency Worker Centre in the bottom right, which not only was set up in Kincardine but actually moved to Port Elgin in the middle of the drill to test out its ability to do that.
- The field hospital here, which was set up in the parking lot of the Southampton Hospital as part of the drill.

- And one of the houses that was destroyed in Port Elgin as part of the overall scenario. In truth, they actually destroyed this house. It was one that was being taken down, so it was a real demolition. So they mounted a considerable rescue in there to get people out of the house that were trapped in it. So it worked out and it was fortunate that the developer was willing to let us use his prop in the exercise.

And to do that, we had to set up a fairly large control area and so we did that in our large auditorium on site just to control all the -- you know, to send the messages out to the various agencies.

--- Video Presentation

**MR. SAUNDERS:** And of course the last thing we needed to test was the durability of the trucks and the pumpers themselves. So we put them through a 24-hour run.

--- Video Presentation

**MR. SAUNDERS:** And in fact we used our portable pumper to fuel those trucks while they're operating. You have to fuel them about every five hours when they're running full tilt like that. So the portable truck comes around and fills them up while they're running, without interruption.

And of course the next step is what about

offsite? Should the emergency get to the point where there's an offsite release, how do you deal with that?

--- Video Presentation

**MR. SAUNDERS:** So just to summarize and go through, you know, what's in place and what yet has to be done:

- so fast hook-up to lake water;
- alternate hook-up to lake water supply;
- fast hook-up for feedwater to individual unit boilers;
- the inter-unit feedwater tie;
- manual opening on the boiler steam relief valves on all units;
- fast hook-up water connections to the primary fuel bay and to the secondary fuel bays;
- fast hook-up water connections to the moderator on Unit 1 and 2;
- heat transport makeup from ECI accumulators;
- passive autocatalytic hydrogen recombiners all done and in place;
- severe accident management method to make up water to the heat transport system;
- severe accident management method to make up water to the moderator -- this basically means that

we manually hook it up rather than using a quick disconnect to do it;

- fast hook-up electrical connections for each unit and the common systems as well as the EFADs;

- fast hook-up electrical connections for containment Emergency Filtered Air Discharge system.

Again, all in place.

Support facilities in place:

- New Emergency Management Centre in place;

- Portable command post in place;

- Communications capability independent of local infrastructure -- so we don't require wires or even cell towers to work;

- new fire training facility, as you have just seen;

- portable high-capacity water pumpers, 5 of those;

- 12 portable power generators;

- portable fuel retrieval and delivery truck;

- portable equipment transportation capability.

Again, all in place.

- Heavy-duty equipment for route-clearing;

- portable equipment storage building;
- firefighting equipment; and
- a maintenance and testing program for all that equipment.

All in place as of today.

Offsite support in place, we've got:

- a communication system that works very well, can talk to people virtually anytime;
- the radiation monitors out to 10 kilometres are in place; and
- we have deployable radiation monitors that we can deploy beyond that should we need to.

Potassium iodide tablets, we actually just started to get the delivery today. They're a little slow. So this is them in the new package and we can let you have a look at those after a bit if you like.

And this is a booklet. It's also on the BePreparedHuronBruceGrey website now with all the different emergencies in it, including nuclear.

The FM-Alert, the radios are here, the system is ready to go. We opted to do the distribution after we do the KI pills so as not to confuse people. So we'll be doing that very shortly and that will actually be a fairly broad distribution because we don't see the FM-Alert as particularly a nuclear capability. It's a



capability that the communities can use for emergencies in general. It just includes nuclear.

Safety assessments. Our Chief Engineer is going to talk to you in a minute about the safety assessments and where we've got to but we've included some pretty extreme external events in here and despite that we broadened the events and broadened the requirements considerably, the addition of the EME, as you might expect, the Emergency Mitigating Equipment as a whole new layer of defence has made a significant improvement on the overall outcome of those PSA results.

And we do have a new capability we're working on to actually assess the deployment success in the world using Monte Carlo methods and we have the basic model in place and we're actually trying to approve it and validate it this year.

So here's the work in progress.

Fast hook-up to the moderator and to the heat transport system. As I said, those are outages starting in 2016; so three units in 2016, three in 2017 and the last two in 2018 to put those in place. They have to be done during unit outages, so they have to stagger through as we go through.

Connection points for additional Emergency Filtered Air Discharge. We start the Bruce B vacuum

building outage on Wednesday and the first one for Bruce B, they will be added at that outage and Bruce A will be added next year during their outage.

Shield tank overpressure protection, that's in the final design stages and we'll have a plan in place as to exactly when we're going to do that by the end of the year. It will likely be in the same timeframe as the moderator makeup. The makeup water kit is already available through the -- or will be available this year for the shield tank overprotection.

--- Video Presentation

**MR. SAUNDERS:** So that was a little long but I thought it important given the central place that Fukushima has taken in the last few years and the amount of effort and time into it to really go through it in some detail and talk about what's really in place, fully in place and what's yet to be done.

So that's it for that presentation.

I'll now move over to Mr. Newman here to talk about PSA.

**MR. NEWMAN:** Thank you, Frank.

Good evening. For the record, Gary Newman. I'm going to be speaking to you this evening about assessing and understand risk. We'll be doing so at a fairly high level. Obviously, we could spend a number of

days discussing this topic were time available.

So for the purpose of this Part 2 Commission hearing we felt it was important to provide more detail on all the work completed to evaluate both internal and external sources of risk, which in turn demonstrates that Bruce Power is compliant with current CNSC regulations.

So, as mentioned, at a high level, I plan to speak to the following aspects.

The historic perspective based upon relevant regulation, which will include establishing and sustaining a credible design. It also involves improving the design through risk-informed enhancements.

We will then move on to a discussion of the evolution and updates to our safety assessments.

That will be followed by a brief discussion on new tools, and Mr. Saunders has already touched on some of that.

The ongoing plant and response planning enhancements, again already touched on by Mr. Saunders, and then a brief summary.

So beginning at the beginning, which is really the *Nuclear Safety and Control Act*, the Act speaks to a reasonable level of risk which is consistent with the value proposition associated with a safe, reliable, clean

and low-cost energy production through the use of nuclear technology. This of course has an explicit commitment to meeting both our domestic and international obligations just like all responsible operators of such technology around the world.

The term "reasonable" of course will always be the subject of debate but in general we have considered industry events that are less than  $10^{-6}$  as incredible.

So achieving a reasonable level of risk is a multi-tiered undertaking. However, first and foremost, it begins with an acceptably safe design.

For new plants, this guidance is captured in CNSC Regulatory Document 2.5.2 and for existing plants Bruce Power has adopted the international 75-INSAG-3 Rev.1. To this end, I should note that the large release frequency criteria captured in that document are less than  $10^{-6}$  for new plants and less than  $10^{-5}$  for existing plants.

And of course once operation begins, one now needs to sustain the safe and reliable design and this is accomplished through a combination of the following:

- monitoring and testing to demonstrate continued operability and reliability of important systems in accordance with that design;

- in addition, we evaluate and implement

important design changes against the design goals;

- we also periodically evaluate plant against new standards to test ourselves and assess the opportunities for improvement. This is part of our ongoing continuous improvement philosophy at Bruce Power.

The design requirements were established in the original Siting Guide, which identified the deterministic design and operating requirements and sets the single and dual failure dose limits.

From a safety report viewpoint, probabilistic assessments were added to the original deterministic toolset beginning in the 1990s. At that time, goals and limits were set for severe core damage, large and severe release, as well as public health criteria.

These early PSAs embraced release thresholds that were approximately five times larger than the current values, which has resulted in the need to produce more accurate predictions within the current assessments. These historic PSA assessments were completed after the plants were in operation for many years rather than as part of the design activity.

Modelling activities were focused on comparing with the new expectations, so in general only enough work was completed to confirm that the limit was

achieved. This meant that many supporting systems were not modelled but simply assumed to not be available as a result of the event, and which adds a considerable amount of conservatism. These assessments were focused on internal plant events, including the loss of offsite power, the latter of which was the single external event that was considered.

As part of the safety assessment evolution, a greater focus on external events was established by CNSC Standard 294 in 2005. However, post-Fukushima, it was decided to broaden the approach to consider lower probability external events, accommodation of a larger consequence but lower likelihood event, and lastly, equipment diversity in the context of the robust nature to resist external disaster scenarios.

As per normal practice, updated Regulatory Documents in terms of both deterministic and probabilistic assessments were issued to guide this work by our regulator.

The release categories were first updated in S-294 based upon international practices and again documented in the Regulatory Documents when these new documents were issues.

So in the case of new reactor facilities, the sum of the frequencies are considered as follows.

In the case of severe core damage frequency, the sum of the frequencies of all event sequences that can lead to significant core degradation shall be less than  $10^{-5}$  events per reactor year.

Similarly, small release frequency is the sum of frequencies of all event frequencies that can lead to a release to the environment of more than  $10^{15}$  becquerels of iodine-131 and are required to be less than  $10^{-5}$  events per reactor year.

And in the case of a greater release may require temporary relocation of the local population.

And finally, the last release related to large release frequency is the sum of frequencies of all events that can lead to a release to the environment of more than  $10^{14}$  becquerels of cesium-137 and are required to be less than  $10^{-5}$  events per reactor year and a greater release may require long-term relocation of the local population.

These definitions were developed based on internal plant events and there remains a discussion about how to properly integrate external and internal events and properly calculate an accurate aggregated release frequency. However, for the purposes of today's discussion, we have simply added them, although we know this is a conservative treatment.

As an example of the continuous improvement process, work has been completed to enhance the Bruce A and B safety reports through updated PSAs which consider fire, seismic, high winds and flooding under both operating and shutdown conditions. This was completed against the backdrop of updated PSA release categories.

The following list the safety improvements that have been installed in the plants and were included in the internal plant event assessments, so, for example, the emergency make-up water from portable equipment directly into the boilers, as already described by Mr. Saunders.

I do not plan to go through the list; however, most of these improvements have been fully installed and credited within the PSAs. Fast make-up water to the heat transport system is currently insured by additional emergency power to the emergency coolant injection accumulator tanks.

Another committed make-up path for Emergency Mitigation Equipment utilizes severe accident management instructions can also be established. Installation of a third path through quick connect fittings is in progress.

Make-up water to the moderator system from Emergency Mitigation Equipment utilizing severe accident management instructions can also be established.



Installation of another path through quick connect fittings is in place for Units 1 and 2, and in progress for Units 3 to 8, as already described.

I should note that there was one additional bullet that may not be your slide, and it's the make-up water to heat transport and moderator systems, which we added afterwards.

As a numerical demonstration of the benefit achieved for the example of at-power events on the large release frequency, this table shows from top to bottom the current results with EME credited for earlier calculated values and the final row with no credit for EME for each of the stations. One can see the drop from  $10^{-6}$  range into the  $10^{-7}$  range when one credits Emergency Mitigation Equipment within the PSAs.

Also, the estimated values for EME were provided in the July submission to the CNSC and more precisely calculated in the November licence application update. The estimates proved to be pretty accurate.

Some safety improvements that were committed and currently in progress as already described by Mr. Saunders are credited in the station aggregation for large release frequencies and external events, for example, enhancements to containment robustness for multi-unit events. Although still a very conservative calculation, it

demonstrates the progress that has been made through the Fukushima enhancements and the value of the work still in progress.

It is also important to note that site aggregation of single unit event frequencies did not attempt to remove the inherent redundancies, and results are considered to be conservative.

And lastly, industry-driven further work is under way to develop a site-based risk model which we believe is currently leading the industry in this area of development.

So on the next slide, we have results for the sphere core damage. This table provides those results for each station for the combination of internal and external events for single-unit aggregation results in column 2 as well as station aggregate results in column 3.

All of these results meet the requirements of the current criteria.

On the next slide, we similarly summarize for large release frequency. These results demonstrate that on both a unit and station basis, we meet the current acceptance criteria.

Just like I described for the severe core damage frequency calculations, we have similarly credited installed EME for release category assessments, and you can

see examples of the noted improvements in the following table.

So for example, the design basis events at both station, one can see the frequency improvement when crediting EME, so that would be comparing the third and the fourth columns. These release frequencies, while still very unlikely, are the most probable.

The releases would occur as a result of venting of containment through the emergency filter ventilation system. This type of venting maintains containment pressure low and prevents release of isotopes that can result in longer-term contamination.

These are the type of events where shelter in place may be a viable option and, as Mr. Saunders has indicated, the use of potassium iodide may be direct.

Similar for the example of large release frequency for Bruce A for the various categories, the decrease in frequency when EME is credited -- so this, again, would be columns 3 versus 4. Release category 2 is approximately equivalent to the generic large release defined in the CNSC study of consequences of a hypothetical severe accident and effectiveness of mitigation measures which examined the extent to which contamination might spread and the potential dose to people.

As you can see, the probability of this

event is less than  $10^{-6}$ , cut-off normally associated with the credible versus incredible event.

And on the next slide, the same, again, for Bruce B, decrease in frequency when EME is credited, well below the  $10^{-6}$  cut-off normally associated with incredible events.

And on the next slide, and in the case of small release frequency reductions for Bruce A when EME is credited, similar sort of improvements are observed.

I should point out that the term "small release", by definition, includes both small and large releases and might more accurately be called "all releases" or "total releases", but this is the current accepted terminology.

And on the next slide, again, the same outcome for Bruce B. And again, as I already noted, the term "small release", by definition, includes both small and large releases and might more accurately be called "all releases" or "total releases".

Moving on to some of the new tools that we're deploying -- and again, this was touched on by Mr. Saunders -- developing which enhance emergency response capability to aid in our already extensive drill requirements by simulating events to identify areas for improvement within existing practices to make them even

more robust.

The tool also provides, through Monte Carlo simulation, the probability of successful deployment of EME under a wide variety of circumstances and points out potential challenges which can then be adjusted to further enhance our response capability.

As I noted earlier in the presentation, there are a number of in-flight projects that are being implemented to add further enhancements to the stations, and these are all on track as described by Mr. Saunders as per schedule and as communicated through formal correspondence with the CNSC.

Current ongoing work supporting response planning, including, as already mentioned, 44 installed monitors within eight-10 kilometre zone automatically -- automated real-time plume tracking system supported by portable monitors available for additional deployment with implementation of automatic real-time feed to both the province and the CNSC organizations.

It is important to note that this is not just a paper exercise, but that the information gained from these assessments is being utilized to enhance both on and off-site emergency response capability.

In addition, work is under way to develop enhanced predictive plume modelling at the industry,

provincial and regulatory levels, and this modelling capability will support assessment of a suite of accident scenarios. This is consistent with the practice by the USNRC.

Working with the province and the municipalities to improve public alerting capabilities for all emergencies through the use of such technologies as described already as the FM-alert, which provides defence in depth, and this is due to begin this spring.

In addition, we are working with Pelmorex and communication companies as already described in video to establish a cellular text alert system.

Again, and as already noted, we are building additional barriers to ensure continuous improving -- continuous improvements to our response capability.

An additional element of our response planning is the distribution of potassium iodine again as already discussed to a radius of approximately 10 kilometres. This measure is just under way with the necessary instructions along with web site and public information sessions.

Once this is complete, we will have measures in place to sustain the program through a periodic refresher program.

And lastly, distribution centres will be set from 10 to 50 kilometres to allow those access.

So then, in summary, we have stated before, and I wanted to re-emphasize, that Bruce Power and the industry have been diligent over the operating life of our plants to review plant design against modern standards, including safety assessment methodologies, and to actually apply this knowledge in real plant enhancements. And I think we've seen some of those in the prior presentation tonight.

The continuous improvement in plant performance that has resulted from this effort is a demonstration of the superior approach in the Canadian regulatory environment, which encourages ongoing improvements.

The Fukushima enhancements have been effective at reducing overall risk. Based on the current practice of analyzing large release frequency against in-plant, and this includes multi-unit events, Bruce Power not only meets the international standards for releases for existing plants but, for the most part, would meet the requirements for new plants.

The work already committed for Bruce A is expected to also bring Bruce A in line with these numbers.

We do expect, as aggregation of individual

results is considered both in Canada and internationally, changes will occur in some of these methodologies. Bruce Power will continue to participate and support this effort.

We have considered the release category results of the PSA work as well as the CNSC study on hypothetical severe nuclear accident and effectiveness of mitigation measures in relation to off-site emergency planning and find that the current planning zones are adequate, but that the reliance on local infrastructure for monitoring and communication in a regional disaster scenario need to be reduced.

Finally, it should be noted that the calculations to complete these assessments were rigorous, with the final results encompassing nearly 40,000 pages. Large amounts of time could be spent debating all the possible permutations, but the work was completed in accordance with approved methodology and at a high level has been summarized in the preceding series of slides.

Thank you.

**MR. SAUNDERS:** Frank Saunders again, for the record.

One short presentation left, from our side anyway, and this really goes to some questions we had from the Commissioners at the last Part 1 hearing around what were the sort of monitoring points we used to assess public



dose. So this is just a short presentation to show you where those various monitoring points are and what they look like. So this is our environmental policy and the key points that we use in our day-to-day operations.

Environmental management encompasses a number of programs. There is an ISO 14001 which governs our management system and then *CSA Standards* govern how we actually carry out a number of these activities.

This is just a depiction of the way that we would assess the dose. You see a family here in the centre somewhat right of that picture and the various ways that emissions from the plant or from anywhere else could actually make their way to them. And this is how we actually assess what the dose might be from the food you eat, the water you drink, the air you breathe, and so forth

So our normal dose that we found in terms of the members of the public has been pretty consistent ever since we have become Bruce Power. It is in the order of 0.1 percent of the safe allowable limit.

So this is where we sit, you know, in the Province of Ontario. The two sources here, of course Bruce B on the bottom and Bruce A on the right, the blue and the red figures there are just indicating air and water emissions.

This picture just shows you the air

monitoring stations that we have scattered around. It takes a continuous error monitor -- a continuous air sample and monitors it, fix it on a filter and allows us to go back to look at it later. This is a picture of one of those stations.

So here are a number of the farm sites that we used to sample and of course we are sampling pretty much what you expect, anything that is grown or eaten or produced on the farm. We ask for people to voluntarily participate and many of them do and they supply us with these materials so we can check them.

So this is -- these are a number of residents where people live, sampling sites. So we do things like sample the water, flowers, vegetables where people are growing them handy. And we use this as part of our input into the dose calculations. You can see there is a fair number of sites that we use. Again, this is all voluntary on people's part, not something that we control, but we ask for volunteers and people have been very good about it.

These are the creek sampling sites or streams, if you would rather call them that. So there are a number of streams around the site that we also sample to look for any kind of runoff or water.

These are thermistors. This is the way we

monitor temperature in the lake. We do have a challenge keeping these thermistors in the lake. When we go through the transition where we just went through from winter to the spring we have a tendency to lose them all and then we start all over again in the spring. The ice here gets quite heavy as you can imagine and tends to kill them, but they are kind of a neat little contraption.

We have actually had some studies underway to turn this into, much like the off-site monitors, into a radio beacon that will send the signal up and we can get a real time. Right now they are recorders, so we are working on that. We had a test one that worked okay. We just need to look at how to do a production now. It has to be reasonably cost because, like I say, we go through a fair number of them.

This kind of puts it all together for you, just to show you the number of points that we look at as part of our dose. Water treatment plants, of course we do look at Southampton and the Kincardine water treatment plants and measure the water intake there. These are all the wells that exist around the site. Some of them are deep wells, some of them are shallow and some of them are industrial and some of them are residential.

We don't sample them all. We sample a number and we keep a log of them so that if we should ever

have an event or a release that we needed to warn people about we know where the wells are

And on site the one last question that we had was around well number four at Bruce A and Bruce B because they were showing slightly higher levels of tritium and you can see in this picture here that the BB-4 and the BA-4 is that well. It's a multilevel well. What that means is it's basically just a dry well. It's not actually used for anything. It is a sample well and you can sample that at various different elevations up to it. So you know when you see sample says BA-41, dash 1, dash 2, dash 3, it's just different levels in the well that's sampled.

And there on the lake side, because we're looking to see whether there is any transmission moving from the plant towards the lake, and they are there to tell us what goes on.

And that concludes the presentations.

Thank you.

**MR. HAWTHORNE:** In summary, Members of the Commission, I think we tried our best here to provide explanatory information on some of the points that were of interest at the Day One hearings and, as I mentioned earlier, the intention here was to provide a bit more explanation of some of the points that either the Commission Members raised or we felt were appropriate given

the tone and nature of some of the interventions. So as was mentioned, we are available to answer questions, but the Commission has chosen to do that tomorrow and that's fine.

I just wanted to say in conclusion from Bruce Power that I myself can't be here all days of the hearing, but I am certainly available if the Commission have any specific questions to ask of me over the course of the next three or four days. But I can assure the Commission that senior officers of Bruce Power will be here throughout.

Thank you very much.

**THE PRESIDENT:** Thank you. I would like to take a 10-minute break, so we will reconvene -- I guess it's -- what time? I can't read. Five past eight.

Thank you.

--- Upon recessing at 7:55 p.m. /

Suspension à 19 h 55

--- Upon resuming at 8:10 /

Reprise à 16 h 10

**THE PRESIDENT:** I would like now to proceed to the presentation from CNSC staff as outlined in CMD 15-H2.B, 2.C and 2.D. I understand Mr. Jammal will

make the presentation. Please proceed.

**CMD 15-H2.B/15-H2.C/15-H2.D**

**Oral presentation by CNSC staff**

**MR. JAMMAL:** Good evening, Mr. President, Members of the Commission. For the record my name is Ramzi Jammal. I am the Executive Vice President and Chief Regulatory Operations Officer at the CNSC.

In a few moments CNSC staff will be presenting to you an overview of our assessment of Bruce Power licence application for the renewal of licences for Bruce A and B stations to include our conclusions and recommendations since the Part 1 Commission hearing at Ottawa on February 5, 2015.

In doing this work, CNSC staff considered Bruce Power's licence application against the requirements set out in the *Nuclear Safety Control Act* and the *CNSC Regulations* that are supported by regulatory documents that the CNSC has developed, national and international standards that the CNSC has adopted. These documents and standards are based on international research and best practices.

As annexed in the CMD, CNSC Staff has use the reference document in the CMDs as on the record

submission to the Commission. These documents were made and are available to anyone who requests the documents or requested the document. Again, these documents are publicly available upon request. We have also reviewed all of the interventions that were made and are available to anyone who requests the documents or requested the document. Again, these documents are publicly available upon request.

We have also reviewed all of the interventions submitted to the Commission, taking into consideration their impact on our conclusions and recommendations, in addition to our staff here in Kincardine who are supported by our staff from Ottawa.

Maintenant je cède la parole à M. Howden pour commencer sa présentation.

Merci.

**MR. HOWDEN:** Good evening, Mr. President and Members of the Commission. My name is Barclay Howden. I am 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. Regulatory and technical staff from the CNSC are also present and available to answer any questions the Commission or intervenors may have.

This presentation provides responses to key intervention topics in relation to the renewal of the Bruce A and B Power reactor operating licences. As you can see from the outline, this presentation focuses on CNSC's regulatory oversight, public and Aboriginal involvement and key topics that were raised in the submitted interventions and, finally, on our conclusions and recommendations.

For background information, 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 31, 2015. Bruce Power has requested a five-year licence to continue to operate Bruce A and B. The proposed licence period is June 1, 2015 to May 31, 2020.

CNSC staff propose a single power reactor operating licence since all regulatory requirements are the same for Bruce A and B and a single licence will provide consistency and clarity. Although Bruce A and B have shared programs, reporting and safety performance



assessment will still be done separately. This administrative licensing change will align with the Commission's direction for a single licence that was done for the Pickering nuclear generating Station and will make both the licence and licence conditions handbook easier to manage.

Bruce Power has not made a decision to refurbish. If Bruce Power decides to refurbish any unit or implement a periodic safety review, Bruce Power must return to the Commission for approval to start such a project in accordance with CNSC regulatory requirements. A public Commission proceeding would follow. As was done for Units 1 and 2 refurbishment, new licence conditions or hold points would then be added to the licence.

I will now pass the presentation over to Mr. Lafrenière who will discuss CNSC's regulatory oversight and the main intervention topics.

**MR. LAFRENIÈRE:** Thank you, Mr. Howden.

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

The Commission granted Bruce Power its first licence to operate 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 and Control Act* and its *Regulations*, as well as the Commission-approved licence conditions. 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 and reviews of information routinely submitted in support of their licence activities.

CNSC staff ensure that Bruce Power are qualified to perform their work, that the plant equipment is maintained and modified if necessary to respond to lessons learned from operating experience. Bruce Power is required to provide reports, notifications and filing of specific records in accordance with CNSC Regulatory Document 3.1.1, Reporting Requirements for Nuclear Power Plants.

CNSC staff track all identified non-compliances to resolution. Risk of 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 Plant Report.

Bruce Power is responsible for ensuring safe operation of the stations, whereas CNSC staff independently verify Bruce Power's performance. As shown in this table, the compliance verification activities by CNSC site inspectors during the current licensing are comprised of numerous walk-downs, inspections and document reviews. These activities represent over 12,000 days of effort by CNSC site staff.

CNSC site inspectors carry out daily walk-downs and field inspections with specialist staff from Ottawa following the CNSC Risk-Informed Baseline Compliance Program. CNSC staff also increase these activities for special projects. They increase in numbers of inspections for 2011 and 12 was due to the refurbishment activities in Units 1 and 2 at Bruce A. These two units were returned to service late in 2012.

CNSC staff confirms that there are no safety significant findings and Bruce Power is in compliance with all regulatory requirements. Bruce Power has responded to the satisfaction of CNSC staff for all issues raised.

CNSC staff identified and engaged the Saugeen Ojibway Nation, Historic Saugeen Métis and the Métis Nation of Ontario for this licence renewal process.

In addition to the information included in the Part 1 CMD, and since the Part 1 hearing, CNSC staff sent copies of the supplementary CMD and the updated Environmental Assessment Information Report to the three Aboriginal groups. Staff followed up to confirm receipt of materials and to answer questions.

At the requests of the Historic Saugeen Métis and the Saugeen Ojibway Nation, presentations were provided regarding the licence renewal process in May 2014 and October 2014 respectively. Following the receipt of the interventions, CNSC staff was made aware of SON's frustration about the lack of information provided in the Part 1 and Part 2 CMDs. CNSC staff has since emailed the SON information identified in their submission.

CNSC staff is committed to our relationship with the local Aboriginal communities and encourages each of them to request information from Bruce Power or the CNSC. Where possible, the CNSC is committed to providing information in a timely manner.

In summary, staff have engaged the local Aboriginal groups with interest in this facility. Staff have provided information, encouraged their participation, made participant funding available and have had continuous communication with each group. Based on this and the information received and reviewed, staff are of the opinion

that should the Commission approved the licence renewal it would not cause adverse impacts to the potential or established Aboriginal or treaty rights.

CNSC staff has an open and transparent regulatory process which encourages participation. In total, there were 10 recipients of the CNSC Participant Funding Program Award for this year. The public were invited to intervene in Part 2 of the hearing which is being held in Kincardine to allow better access for the local communities.

CNSC staff have reviewed all interventions. The four main intervention topics are environmental impacts, probabilistic safety assessment, severe accident and emergency preparedness. These topics will be discussed in the following slides.

The table on this slide shows the commercial harvest of all commercial species of fish, including lake whitefish, lake trout, yellow perch and walleye and the Bruce impingement and entrainment impacts compared to the 2013 quota set by the Ontario Ministry of Natural Resources for Zone 1. Zone 1 is the area of the lake right off the Bruce site.

The fishery management objectives of the Ministry of Natural Resources and Forestry are to manage fish levels for sustained and annual harvest across Lake

Huron. The Ministry of Natural Resources and Forestry sets quotas in order to achieve these fishery management objectives; that is, the quotas are set to allow for a sustainable fish population.

In the data provided by the Ministry of Natural Resources and Forestry in the Lake Huron Basin Fisheries Report, it is seen that the commercial fisheries harvest approximately 77 percent of the quota. Impingement and entrainment due to the operation of the Bruce Power Plant represents about 2.1 percent of the quota. This is an overly conservative comparison given that the quota for Zone 1 is a quota for only lake whitefish. When comparing actual impingement and entrainment of lake whitefish to the Bruce Power operations to that of this lake whitefish quota, it amounts to 309 kg of biomass, or about 0.16 percent of the quota. In other words, there is negligible reduction in the volume of fish in Lake Huron Zone 1 due to the impingement and entrainment from Bruce Power's operations of the plant.

The Environmental Assessment Information Report which was appended to the Part 1 CMD was updated to provide minor clarifications and new information and again appended to the Part 2 CMD. Bruce Power recently submitted their Environmental Risk Assessment in accordance with the CSA Standard N 288.6. It was reviewed and reaffirmed the

previous conclusions that adequate provisions are being made by Bruce Power for the protection of the environment.

Other updates to the Environmental Assessment Information Report were made regarding thermal discharges, tritium concentrations and CNSC's independent Environmental Monitoring Program. Previous environmental assessments concluded that there are no significant environmental impacts and that adequate provision to protect the environment is being made by Bruce Power. Environmental assessment monitoring and data are sufficient to reaffirm this conclusion that the environment is protected.

In December 2012 Parliament passed amendments to the *Fisheries Act* which, among other things, focuses on the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries and enables enhanced partnerships between different federal agencies for the implementation of the new *Act*. Subsequently, Fisheries and Oceans Canada and the CNSC entered into a Memorandum of Understanding for the cooperation and administration of the *Fisheries Act* related to nuclear material and energy developments.

CNSC is acting as the Crown Consultation Coordinator with the three Aboriginal groups mentioned previously. Letters were sent to the groups with the work

plan describing the process. This was followed up with meetings.

It should be noted that the *Nuclear Safety and Control Act* and the *Fisheries Act* both protect the environment, but each have a different test. Under the *Nuclear Safety and Control Act* the protection of the environment for fish is assessed at the population level, whereas under the *Fisheries Act*, the assessment of "serious harm to fish" is based on the definition of the population in the *Fisheries Act* which is "death of fish or any permanent alteration to fish habitats."

Environmental protection is covered by many different pieces of legislation in Canada even beyond the two mentioned here. They work in a complementary manner. However each Act must be complied with separately. Compliance with one law does not curtail the authority of another. In other words, the issuance of a licence under the *Nuclear Safety and Control Act* has no interaction with the issuance of an authorization under the *Fisheries Act*. A power reactor operating licence can be issued without a *Fisheries Act* authorization since there is no unreasonable risk under the *Nuclear Safety and Control Act*.

Based on the data available from Bruce Power on the intake of fish mortality, the Department of Fisheries and Oceans determined that the fish mortality due



to the impingement and entrainment at Bruce A and B are resulting in serious harm to fish; that is, death of fish, which is prohibited under section 35(1) of the amended *Fisheries Act*.

Bruce Power was notified of the need to apply for an authorization under the *Fisheries Act*, as an existing facility, in order to be in compliance with this legislation. Following this, several discussions have occurred between CNSC, Fisheries and Oceans and Bruce Power related to this topic. These discussions cumulated in Bruce Power providing a draft self-assessment in early February 2015 which contains much of the technical data that will eventually go into the application itself.

CNSC staff reviewed this information and identified a couple of areas that required additional analysis or clarification. This was discussed with Bruce Power and they subsequently revised their assessment to incorporate these items. The revised assessment was provided to CNSC staff at the end of March 2015.

CNSC staff have reviewed the revised assessment and confirm that the data presented is acceptable. The next steps in the completing of a fisheries authorization will include quantifying the benefits of Bruce Power's proposed offsets and performing Aboriginal engagement on this matter. These are both

requirements of the application itself set by Fisheries and Oceans Canada.

There have been some preliminary discussions with Bruce Power regarding what activities they are already performing which may be able to count towards offsetting measures. Further discussions are required between all parties to ensure that they are acceptable.

Another requirement of the application is for Aboriginal engagement activities to take place. The future application is expected to have the Aboriginal groups' feedback incorporated and details of what the groups have raised as concerns, including how these concerns were addressed. Timelines for Bruce Power submitting a *Fisheries Act* application depends on how long this engagement takes.

In summary, the technical assessment of impacts for the application is complete. Based on CNSC staff assessment there are measures that can be done to deal with the impacts. These would be the offsets. However, engagement on the assessments and the proposed offsets is still required with the Aboriginal communities. Nonetheless, CNSC staff are confident that there are no issues that should impact the licensing process under *the Nuclear Safety and Control Act*.

Probabilistic safety assessments is a

relatively new analytical tool that complements the deterministic safety analysis which was the original design basis of the plants. The plants were designed using deterministic safety rules and improving engineering past practices which considered defence in depth, radiation protection and safety margins.

CNSC staff have reviewed and accepted all deterministic safety analysis which demonstrates all installed trip points provide adequate coverage. In other words, the reactors will automatically shut down in the event of an emergency or accident.

In terms of probabilistic safety assessments, CNSC staff have reviewed and accepted all methodologies and Bruce Power is compliant with CNSC Regulatory Document S-294. In addition, all the safety goals and limits are met for both Bruce A and B. Bruce Power continues to meet their PSA -- continues to update their PSA by taking into account newly acquired emergency mitigation equipment to address the Fukushima action items. This demonstrates the safety value of these improvements.

A CNSC study called the "Study of Consequences of a Hypothetical Severe Nuclear Accident and Effectiveness of Mitigation Measures" was presented to the Commission on March 26, 2015. This study addressed the consequences from severe accidents in light of

post-Fukushima enhancements. Hypothetical severe accident doses comparable to the Fukushima event were considered in this study.

CNSC staff concluded that it is nearly impossible to distinguish most radiation-induced cancers from baseline cancers. Childhood thyroid cancer is the only radiation-induced cancer that could be distinguished from baseline cancers. However, emergency response would allow this risk to be further mitigated.

Staff also concluded that given all the reactor safety enhancements installed at Canadian nuclear power plants in response to lessons learned from the Fukushima accident, the release of radioactivity of the magnitude of Fukushima, which was an INES Level 7 event, is extremely unlikely.

Finally, the environmental assessment conducted in 2006 under the *Canadian Environmental Assessment Act* concluded that there are no significant adverse effects on the environment from a nuclear accident.

In the event of an emergency, Bruce Power has emergency plans in place and coordinates its response with municipal, provincial and federal levels of governments' emergency plans. Bruce Power's emergency plan has been reviewed and accepted by CNSC staff. The plan is subject to compliance activities to ensure that it is

implemented and maintained in accordance with CNSC regulatory requirements.

The new CNSC regulatory document 2.10.1 entitled "Nuclear Emergency Preparedness and Response" replaces the current CNSC regulatory documents RD-353 and G-225.

REGDOC 2.10.1 is included in the proposed Licence Conditions Handbook. Full implementation is expected by December 31, 2018. This is acceptable to CNSC staff since Bruce Power is compliant with the current regulatory requirements during this transition period.

The Province of Ontario holds jurisdiction over the defined zones in Ontario Nuclear Emergency Planning. The current zones are the contiguous zone, which is a radius of 3 km from the reactor buildings; the primary zone, with a radius of 10 km, and the secondary zone with a radius of 50 km.

The CNSC requirements regarding potassium iodide pills are twofold. Firstly, pre-distribution to all residents, businesses and institutions in a 10 km primary zone must be completed by December 2015. At the time of the writing of the Part 1 CMD, the provision was only for institutions. This was subsequently expanded to include residences and businesses. Bruce Power will meet this commitment. In fact, distributions out to the 3 km zone is

expected to start this week and be completed by early summer.

The second requirement is to pre-stock KI pills out to the 50 km radius. Bruce Power will meet this commitment by December 2015.

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

**MR. HOWDEN:** Thank you.

Based on the assessment of Bruce Power's safety performance, CNSC staff conclude, 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 licenced 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 like now to provide CNSC staff's overall recommendations before closing. In regard to Bruce Power's request for licence renewal of the Bruce A and B nuclear generating stations, CNSC staff recommend that the Commission accept CNSC staff conclusions and recommendations presented in CNSC staff's CMDs 15-H2 and 15-H2.B. It should be noted that supplemental CMD 15-H2.D

was submitted to the Commission on April 7, 2015 for information only. It provides an update on the application for a *Fisheries Act* authorization, an update on the Environmental Assessment follow-up monitoring program and clarification on the assessment of fish population impacts. 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.

Finally, CNSC staff recommend that the Commission authorize Bruce Power to operate Units 1 to 8 up to the hold point of 247,000 equivalent full power hours, as per the authorization that the Commission granted to Ontario Power Generation for the Pickering nuclear generating station in paragraph 113 of the *Record of Proceedings, Including Reasons for Decision*, from the May 7, 2014 public hearing regarding the 210,000 equivalent full power hours hold point removal. The recommendations described in this presentation are included in the information provided in CMD 15-H2.B.

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 many improvements and adequate safety measures to ensure 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 Members of the Commission. We are prepared to take any questions. Thank you.

**THE PRESIDENT:** Thank you. As you probably can guess, we have lots of questions. However, we promised that we will not go beyond 9:30 and we reserve, as our normal practice, to start with the interventions.

As was explained before, we will deal with themes the next three days. So what we thought we would do tonight is try to deal with some of the written submissions which will raise some questions all by themselves, but the main themes will be actually discussed over the next three days.

So, colleagues, let's switch to our written material.

And I would also like to acknowledge that we have people from Environment Canada and Fisheries and Oceans should a question come up. So I understand that Ms Ali is here and Mr. Kim is here. Thank you.

I also understand that Mr. Hoggarth and Ms Wright is also here. Thank you for being here. I assume you are also going to be here throughout those three days or whenever we need you. Okay, thank you.



So Marc, over to you.

**MR. LEBLANC:** So we will now proceed with some written interventions. I will introduce the submission and ask Members if they have any questions on those. I will also refer to the number, the CMD numbers so that they can be referred to.

**CMD 15-H2.9**

**Written submission from Water Level Alliance Inc.**

**MR. LEBLANC:** So the first intervention is the written submission from the Water Level Alliance Inc., which is CMD 15-H2.9.

**THE PRESIDENT:** Anybody? Mr. Tolgyesi?

**MEMBRE TOLGYESI :** Merci Monsieur le Président.

In this submission in the third paragraph there is mention that:

"In 2012-2013 Lake Huron reached its lowest recorded water levels since measurements began in 1895."

Do you have any comments? What I'm talking, people from Environment Canada, is there any impact on the fish which could intervene or interact with what has happened with the operations of Bruce Power?

**THE PRESIDENT:** To whom do you address it?

**MEMBER TOLGYESI:** Somebody from  
Environment Canada.

**THE PRESIDENT:** You get the first  
question.

--- Laughter / Rires

**MS ALI:** Nardia Ali, Environment Canada,  
for the record.

If I understand your question correctly,  
you are asking if the lowering of the lake levels in Lake  
Huron over the last few years have had any effects on the  
fish and fish populations. I don't have much of an answer  
to offer you because there haven't been any conclusive  
studies done to assess this.

**MEMBER TOLGYESI:** Is there something, a  
study that takes consideration of what could be a potential  
interaction between the consequence of lower level in the  
fish and interaction with Bruce operations?

**MR. KIM:** Duck Kim, for the record.

As you are aware, we are working with  
Bruce Power and CNSC on the effects of thermal discharge on  
fish, white fish specifically in Lake Huron, a couple of  
other species.

As for the effects of the water levels,  
that is being considered. But I think the general

expectation is that as water levels change, in this case lowered, fish would migrate to the habitat that is suitable to them. So generally I think the fish would adapt to the different depths in the Lake, but in terms of the thermal effects, that is something that we are continuing to look at.

**THE PRESIDENT:** Staff...?

**DR. THOMPSON:** Patsy Thompson, for the record.

Just to put the question and the response for Environment Canada in context, the operation of the Bruce stations would draw water from the lake for cooling water purposes and they would draw large quantities of water. But the same quantity of water more or less is returned to the lake so there is no net removal of water from the lake so the operation of the plant would not have an impact on reducing the lake levels.

**THE PRESIDENT:** Dr. Barriault...?

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

I guess, you know, what I'm interested in is how significant is this drop in water. I'm sure it has been monitored by Bruce. Can you give us some idea and what impact would it have on your cooling system, if any?

**MR. SAUNDERS:** Frank Saunders, for the

record.

I'm afraid I don't have the actual data with us, but the lake is known over history to go through these cycles and this is another cycle. And the extremely warm weather we had over the last few years, if you read the report, suggest that evaporation is the big issue that lowers the lake levels. I think from the point of an impact our intakes are in deep water so not an impact from us getting the cooling water.

The studies that we have been doing as part of our EA follow-up and some of which you will hear tomorrow from the owners group have by coincidence all been done at this point in time when the lake levels are at their lowest, so the data that we are receiving is actually very appropriate to these low levels. The levels have actually started to increase last year and I'm sure they will this year given the winter and the snow that we had, but I'm sure it will continue to be a cycling thing.

But I think the good thing is the data we have is actually at a low point and the like so it will be the most conservative data that it is possible to have.

**MEMBER BARRIAULT:** Any idea of how much the lake has dropped in that period of time and the meters, half a meter, whatever? Don't know?

**MR. SAUNDERS:** It's in the order of

several feet, but just it's not in my head right at the moment --

**MEMBER BARRIAULT:** That's fine.

**MR. SAUNDERS:** -- but we will bring it back for you tomorrow. I know where to find it. I can get a fairly quickly.

**MEMBER BARRIAULT:** Thank you.

**THE PRESIDENT:** I suspect all the cottage owners would know precisely. I understand they have 24,000 now to join this group, presumably they want something to be done about this. I'm just curious whether Fisheries and Oceans, is that something that Fishery and Oceans Department would be interested in?

--- Pause

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

We have been looking at the water level fluctuations and they have been ongoing. I think, like the Bruce Power people mentioned, this is a cycle that has been going on for hundreds of years and we have been -- we do -- we have made an assessment of these changes and we actually when we are doing review on projects that are in Lake Huron, use an elevation of 17,696 to indicate to us where sort of the average water level is. So it's the 80th percentile.

I didn't realize there would be questions on water levels here today so I don't have the specifics. But again we could be bringing it, if you would like, take an undertaking and provide you with the curves showing you all the differences.

And like the Bruce people had mentioned, the expectation is that water levels are going to start rising, especially with the cold winter we have had and Lake Superior was completely ice covered over and that seems to be an indication of where the water levels go up and down.

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

**THE PRESIDENT:** Did you look at whether there is an impact on commercial fishing, for example?

**MR. HOGGARTH:** No, we had not looked at whether there was an impact on commercial fishing, but one of the reasons why we came up with the -- so, like I said, we have used the 80th percentile to decide where we think a water level -- so if there are impacts below 17,696 we actually physically look at that as a potential impact on fish habitat. That number was picked because some species, and northern pike is a good example of it, do require to have sort of flooded areas for spawning at minimum once every five years for them to be able to be successful, keep

their population moving.

And so we have looked at those kinds of stuff, but we haven't looked at whether there is an impact on the commercial fisheries. That probably should be best put to MNR, the Ministry of Natural Resources and Forestry. They may have it.

**THE PRESIDENT:** Thank you.

Dr. McEwan...?

**MEMBER MCEWAN:** Just one of the parts of this letter, the invasive species called phragmites. It's the first time I have read about this in any of the hearings. What is it? Is it associated with the drop in water level? Is it associated with Bruce Power activities, or is it just an interloper?

--- Pause

**MR. HOGGARTH:** Tom Hoggarth from Fisheries and Oceans.

So phragmites is an aquatic plant or a semi-aquatic plant, and it has just been -- my understanding is it is a plant that was introduced as a garden plant and it has just moved out, it is everywhere, it is not just associated with Bruce, it is not associated with low water levels. All the ditches across all the highways in Southern Ontario you will find phragmites.

**THE PRESIDENT:** Does it block any of the

intake pipes?

**MR. SAUNDERS:** No, it is not an issue from the plant, it is an issue for fish breeding in some of the swamps in the lake, and that is why there is a fair amount of work. And we work with a number of local communities to help clean it out so that it doesn't interfere. But it doesn't float around and get sucked into intakes or anything like that.

**PRESIDENT:** Thank you.

Anybody else?

Okay. Marc?

**CMD 15-H2.14**

**Written submission from**

**Sheet Metal Workers International**

**Association - Local Union 473**

**MR. LEBLANC:** The next submission is from the Sheet Metal Workers International Association - Local Union 473, and it is at CMD 15-H2.14

**THE PRESIDENT:** Questions? Questions?

Okay, thank you.

**MR. LEBLANC:** I note in this regard we have several unions that will be presenting in the next two days, so there will be plenty of opportunities to address



those issues.

**CMD 15-H2.19**

**Written submission from Grey Bruce Health Unit**

**MR. LEBLANC:** The next written submission is from the Grey Bruce Health Unit, it is CMD 15-H2.19.

I would just like to remind the members that we have heard from Dr. Hazel Lynn, and she will be available on Thursday this week, but you may still have questions on the submission that has been filed.

**THE PRESIDENT:** Ms Velshi?

**MEMBER VELSHI:** So my question isn't around health, because I know we are going to cover that on Thursday.

But Dr. Lynn, on the second page, talks about Bruce Power assisting the health unit with the environmental programs testing and monitoring of air and water.

So I just wanted to get some more details around what that testing program is and maybe staff or, Dr. Lynn, maybe you can elaborate on what your program is, and whether those results get shared with staff and get consolidated with what we see.

Oh, sorry, Dr. Lynn is not here today.

So, Staff, do you get to see the results of the health unit's testing program?

**DR. THOMPSON:** Patsy Thompson, for the record.

No, we don't.

**MEMBER VELSHI:** Bruce Power, do you have any comments on that?

**MR. SAUNDERS:** Yes. We provide a number of data to the health units around air testing and the data that we collect for our own purposes, and we provide that data to Dr. Lynn and others, which is useful.

We also contributed quite a lot to a number of health programs in the area generally in terms of hospital and hospital support. So I believe that is what she is referring to, but we will take an action to get some specifics for you. I don't know if I know the detail exactly.

**THE PRESIDENT:** Dr. McEwan?

**MEMBER MCEWAN:** So just a question about the potassium iodide plan and the rollout. Have they had a role in helping you with the planning and do they have a role in ongoing education?

**MR. SAUNDERS:** Yes, they do. Frank Saunders, for the record.

In fact, we have a video that goes with

that booklet that I just gave you; it features Dr. Lynn talking about the pills and how they are used and how long they are good for. And that packaging was all approved by the medical officer in terms of the wording and so forth.

So, yes, they have had a significant role and I know she will be here to talk about it, and I am sure she would be happy to verify that.

**THE PRESIDENT:** Anything else?

I guess we will have lots of questions for Dr. Lynn when she comes in.

**MR. HOWDEN:** Dr. Binder, may we just make one comment?

**THE PRESIDENT:** Sure.

**MR. HOWDEN:** I would like to ask Jeff Stevenson just to comment on our last answer.

**MR. STEVENSON:** Jeff Stevenson, Power Reactor Site Inspector, for the record.

Bruce Power does hold biannual regulatory information sessions where all the regulators for the Bruce Power Plant get together to discuss the issues that they have.

And I know that Dr. Lynn is very passionate about these two issues, so she will be able to talk to you more about that on Thursday.

But we are aware that Bruce Power is

working with the health unit on these issues. And from the CNSC's perspective, we have no concerns on these matters.

**THE PRESIDENT:** Okay. Thank you.

**CMD 15-H2.25**

**Written submission from Green Party of Ontario**

**MR. LEBLANC:** The next submission is a written submission from the Green Party of Ontario at CMD 15-H2.25.

**THE PRESIDENT:** Dr. McDill?

**MEMBER McDILL:** Thank you. It is difficult to know precisely what the intervenor means. But I wonder if I could ask staff to comment on the history of licence length going back sort of 10 years? When I joined the Commission the licences were very short.

He may mean unprecedented for eight reactors or he may mean unprecedented for five years. So perhaps you could just comment on licence length?

**MR. HOWDEN:** Thank you. Barclay Howden speaking.

I don't think they are unprecedented. But I think you will probably recall that in around 2002-2003 Staff introduced to the Commission flexibility in licence lengths which the Commission at the time was very open to.

And from that point on, we started moving from two-year to five-year licences. So we have actually been doing five-year licences for close to 10 years now. So five years isn't unprecedented. And the last licence length for Bruce Power was for five years.

The eight units is just combining the two stations together. I think the difference is right now the eight units are operating, which hadn't been the case for quite a period of time. But staff sees no new precedents being set with proposing a five-year licence for the two stations together.

**MEMBER McDILL:** So, Bruce, over the last few years you have had -- two years, all eight reactors running under two different licences?

**MR. SAUNDERS:** That is correct; the Bruce A licence and a Bruce B licence since 2012 I guess.

**MEMBER McDILL:** Okay. Thank you, Mr. Chair.

**MR. HOWDEN:** May I add, Dr. McDill, that one of the reasons for going to the single licence -- now, the Commission already accepted this for Pickering -- but the two stations do share common programs. The single licence is easier to manage because it provides consistency and clarity across the two. The regulatory requirements are the same.

But we want to distinguish that the performance reporting will be done as separate stations when we give performance reporting in the NPP annual report.

**MEMBER MCDILL:** I will come back to this question with the interventions later in the next few days.

**THE PRESIDENT:** Okay, thank you.

Ms Velshi?

**MEMBER VELSHI:** This intervenor and many others have raised a similar issue around refurbishment, and we know that no decision has been made on refurbishment.

But can you review what the public's review, the involvement process, would be in that decision and the part forward on licensing activities around that please?

**MR. HOWDEN:** Yes, Barclay Howden, speaking.

So if refurbishment were to go ahead, they would go through basically a four-step process which is setting up the basis, which is the scoping of the work, then going through a safety factor review, which is reviewing 15 safety factors that, if you recall, with the periodic safety review we spoke about that.

Then they come up with a global assessment

report, which is basically pulling everything together, which is a holistic report. And then, finally, they would propose an Integrated Implementation Plan, the IIP.

In terms of the regulatory process for that, the first three parts are reviewed with CNSC staff, but we would provide updates to the Commission as time went on.

In terms of the decision making process, when that time comes, the Integrated Implementation Plan would be presented in a hearing proceeding to the Commission such that people would have the opportunity to intervene, and that would be their opportunity to see what the proposed improvements would be, and then input to the Commission in terms of -- giving you their input in terms of what they think the regulatory controls should be in place.

So normally for the previous refurbishments, they were issued, and then there were hold points put in as the licensee went through to allow the Commission to visit those hold points and to release them before returning the reactors to service.

**MEMBER VELSHI:** So the public would have an opportunity to comment on the first three steps as well too?

**MR. HOWDEN:** I think they would have an

opportunity to comment when they were being rolled up towards the end, when the global assessment report came together and when the integrated implementation plan came together.

But they would be aware of it through the annual NPP report, which actually does allow written interventions, so they could have input at that time.

**MR. JAMMAL:** It is Ramzi Jammal, for the record.

To complement Mr. Howden's answer, we established life extension, which includes refurbishment, we published documentation starting from RD-360 and the PSR. We are going through consultation period for the public to provide their input.

So the process is transparent, so the review is done by Staff. But nothing can be done without the Commission's approval of the Integrated Improvement Plan, that will be done through public proceedings.

**THE PRESIDENT:** Maybe that is a good time to ask Bruce to comment. Many intervenors talking about this dealing and wheeling behind closed doors with the Ontario Government about next steps.

Anything you want to add, comment as to...? What can you tell us about this?

**MR. HAWTHORNE:** For the record, Duncan



Hawthorne.

I think I answered this at the last hearing, but I will answer again for the benefit of the Commission.

We are here seeking a five-year licence for our units to operate for the full five-year period. We have no plans to refurbish within that lifecycle.

Notwithstanding that, there is an ongoing discussion with Ontario's market operator on an optimal route to refurbish the nuclear units that were outlined on the long-term management plan.

From a regulatory point of view, if that requires us to refurbish our units early, then Mr. Jammal just explained what the process is for doing that.

I don't intend at any point, in any forum, to discuss commercially sensitive information about what we might or might not do with our units.

But many people ask me, you know, what are the plans? And right now, my message has been we are in discussions with the government through the IESO, the market operator, on how best to take forward the intentions of the long-term management plan.

None of that conversation in any way undermines our relationship as a licensee. We understand if we do change any of our plans over the site that the

regulatory process to do so is very clearly defined, and we will comply with that.

But for now, we are asking for a five-year licence which is justified based on the operational life of our units, and really nothing more to say on that.

**THE PRESIDENT:** Well, that is why I asked the question, because we are not party to this conversation either. So I thought we should take it off the table. We are not dealing with refurbishment, we are dealing with licence, five-year licence.

Marc?

**MR. LEBLANC:** Yes. I should have noted that this particular intervention or submission, there is about 30 that are similar that we will go through in the next couple of days.

Only I think one of them has accepted or is taking the opportunity to speak to us, and I think that is tomorrow. So if there is more questions on this towards the writers of those types of submissions, then there will be an opportunity to ask more questions.

**CMD 15-H2.28**

**Written submission from Sat Khalsa**

**MR. LEBLANC:** So the next submission is

from Sat Khalsa, it is CMD 15-H2.28.

**THE PRESIDENT:** Dr. McDill?

**MEMBER MCDILL:** In the second paragraph, the intervenor refers to reconstruction not being in the initial plans for these reactors.

Maybe, Staff, you could clarify it for me or, Bruce, was there not in the original CANDU to sign an expectation of at least some level of refurbishment in the design?

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

One of the features of the CANDU design is in fact the ability to replace on component basis. The original design life was characterized as being conservative. But nonetheless, one of the features of the design is it would be possible to replace aging components.

It wasn't contemplated in the original safety case, but that is why we have RD-360 and all the other regulatory documents that exist today, that is why we have the obligation to continue to upgrade our units, to make them applicable to modern codes and standards.

So it is probably fair to say that it wasn't specifically written down that when it gets to this age you can replace the following components. It is sort of like you buy a room, it doesn't say you can change the

handle and the head as many times as you like, but we all know you can provided you take the appropriate steps.

And that is the way it is with our nuclear plant design. Many of the components that we have changed or are proposed to change have in fact already been done. There is nothing new that hasn't been done; fuel channels have been replaced individually in the past, as have many of the aging components.

What refurbishment looks like is, as well as doing that, justifying the operating life of all of the other components which I think is very well articulated in RD-360 and supporting documentation.

**THE PRESIDENT:** Anybody else? Thank you.  
Marc?

**CMD 15-H2.22**

**Written submission from CANDU Owners Group Inc.**

**MR. LEBLANC:** The next submission is from the CANDU Owners Group, CMD 15-H2.22.

--- Pause

**MR. LEBLANC:** The next submission --

**THE PRESIDENT:** Hold on, hold on.

Anybody?

Maybe to Staff. I know that they have a

research program that they are continuing to evolve. You will report progress on this from time to time. When is the next time we are going to hear about what the future research program looks like?

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

It is a regulatory requirement for the licensees to submit through COG, the COG Research Program, and that is done annually.

Gerry Frappier will give the exact date when the next one is due, but it is shortly I believe.

**MR. FRAPPIER:** Gerry Frappier, for the record.

So we have received COG's plans for research, we review them, and in fact in May we will be having a workshop between the CNSC and COG to hear results of the research that has been done and to discuss our research that is going forward or that they plan on doing with quite a bit of detail. We have the actual researchers from the universities present and giving their presentations, if you like.

And that both keeps us up-to-date and allows them to have some interaction with areas that the regulator is interested in for future research. So that is coming up May 21<sup>st</sup>, 22<sup>nd</sup>, something like that.

**THE PRESIDENT:** Thank you.

Marc?

**CMD 15-H2.23**

**Written submission from**

**Canadian Association of Nuclear Host Communities**

**(CANHC)**

**MR. LEBLANC:** The next submission is from the Canadian Association of Nuclear Host Communities, CMD 15-H2.23.

**THE PRESIDENT:** Questions? No.

**CMD 15-H2.27**

**Written submission from David Kidd**

**MR. LEBLANC:** The next submission is I think is from -- the same type of letter that we had received from the Green Party of Ontario, is from Mr. David Kidd, CMD 15-H2.27.

--- Pause

**CMD 15-H2.3**

**Written submission from Stewardship Grey Bruce**

**MR. LEBLANC:** So the next submission is from the Stewardship Grey Bruce, it is CMD 15-H2.3.

**THE PRESIDENT:** Questions? Out of curiosity, the intervenor mentioned somebody by the name of Francis Chua. I am curious to know who is Francis Chua?

**MR. HAWTHORNE:** Francis Chua is a member of our organization, environmental group, Environmental Department Monitor.

**THE PRESIDENT:** Okay, thank you.  
Anybody else?

**CMD 15-H2.4**

**Written submission from**

**Big Brothers Big Sisters of Kincardine & District**

**MR. LEBLANC:** The next submission is from the Big Brothers Big Sisters of Kincardine & District, CMD 15-H2.4.

--- Pause

**CMD 15-H2.7**

**Written submission from**

**Butterfly Gardens of Saugeen Shores**

**MR. LEBLANC:** The next submission is from Butterfly Gardens of Saugeen Shores, CMD 15-H2.7.

**MEMBER MCEWAN:** Again, the theme of this is sort of a number of these is and will be corporate citizenship.

How do you actually decide where you will provide that level of corporate citizenship both in a generic term, because it is how do you fit it into the community, but in a specific term, how would you pick a group who came to you and said, would you be prepared to consider supporting this project or that project?

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

It is a good question and I would say it falls in three or four different camps. One, is we do have an environmental fund that we allocate on the basis of things like this particular intervenor, and it will deal with lots of things like Ducks Unlimited, Waterkeepers, your fishing associations, all of whom play some role in supporting the environment around us.

In addition to that obviously we provide



sponsorship to community needs, medical health centres, things like that which are really both corporate/social responsibility to support the needs of the community.

And then there is another level of support for things like United Way and other community requirements that we do. But I would really see them being consistent with our corporate values. You know, we tend to support family needs. We support mental health initiatives, community requirements in that regard. We certainly support First Nation communities, in particular say the fund for that.

We typically spend about one and a half million annually to support those various initiatives. I can tell you, in my time here we haven't really turned anyone down.

The ones that we turn down will typically be sports teams and things like that, hockey tournaments, with the exception of First Nation groups. We tend not to support those things because frankly we could eat the whole million and a half, you know, equipping kids with hockey equipment.

We tend to make it more meaningful in terms of corporate citizenships, so to support corporate values such as your living snow fence. If you had been in this area a couple of months ago you would know what

Highway #21 is not the best road to travel. So for a number of years we have planted trees along the highway to try and protect it from winter storms.

And so it is things like that that tend to be meeting community needs.

**THE PRESIDENT:** I have a personal interest. So monarch, the butterfly, why that? And is there an impact that you actually noticed as being...?

**MR. HAWTHORNE:** No. The reality is, it is exactly as Dr. McEwan raised, we are approached by people who have a particular stewardship for that in this area.

It is not because there is any impact related to our activity, it is just it is of particular interest in the community and it is a group that asks for some funding support and we are happy to provide it.

**THE PRESIDENT:** Thank you.

Marc?

**CMD 15-H2.10**

**Written submission from**

**Habitat for Humanity Grey Bruce**

**MR. LEBLANC:** The next submission is from Habitat for Humanity Grey Bruce, CMD 15-H2.10.

--- Pause

**CMD 15-H2.11**

**Written submission from Our Kids Bruce Grey Foundation**

**MR. LEBLANC:** The next submission is from Our Kids Bruce Grey Foundation, CMD 15-H2.11.

--- Pause

**MR. LEBLANC:** No?

**CMD 15-H2.12**

**Written submission from Grey Bruce Sustainability Network**

The next submission is from the Grey Bruce Sustainability Network, which is CMD 15-H2.12.

--- Pause

**CMD 15-H2.13**

**Written submission from**

**Martin Aboriginal Education Initiative (MAEI)**

**MR. LEBLANC:** The next submission is from the Martin Aboriginal Education Initiative, CMD 15-H2.13.

**THE PRESIDENT:** This is the Paul Martin initiative that's been going on.

I have a curious -- I think many people are asking this question about supporting some of the Aboriginal kids. The statistics are how many of those you -- that go such programs actually end up working for you guys?

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

One of the -- one of the challenges we still have is I see bringing more Aboriginal employees into our workforce. We're trying to go further down the pipeline.

Quite honestly, Chief Rook and I discussed this just a couple of weeks ago here. We're offering now scholarships.

One of the challenges we have is getting interested First Nation people to the entry level qualification. We think the best way to do that right now is to help with scholarships to encourage schools and colleges.

We've got a program in place to do that so, frankly, it's an area I still feel there's a lot of untapped potential.

Paul Martin's initiative, our own initiative on scholarship are very complementary in that regard.

The programs aren't integrated because you're -- later on, you'll see a submission from Right to Play because, again, we support that because it's all part of engagement and development of First Nation youth.

We don't have nearly enough First Nation employees. We don't. And that's largely driven by qualification. It's not lack of interest on our part and, frankly, I'd like to do more.

And we kind of came up with what we're calling a fast track solution to that, but it's a combination of all of those things.

It's Right to Play, it's the scholarships, it's setting up programs with Georgian College and others.

We're particularly tracking positions like radiological technicians, which we think is one route in, plant operators, several maintainers, some of those areas. So we're actually trying to stream the specific jobs and marry those to college programs and then provide scholarships to get through those programs.

But it's -- it's not a quick fix. It'll take a dedicated commitment over many years to bring those through.

In the short term, we are finding qualified candidates and trying to fast track them through our recruitment process.

Again, not entirely without challenge because there's a trade union element to that in terms of seniority and other things that have to be managed, but we are -- I, personally, am committed to making this work.

THE PRESIDENT: Thank you.

Next.

**MR. LEBLANC:** Before proceeding to the next submissions, Mr. Saunders, I understand you have information on water levels.

For the record, can you just mention what it is?

**MR. SAUNDERS:** Yeah, I was going to bring it up when you got to the end.

Frank Saunders, for the record.

So one of our staff watching on duty on the webcast somewhere sent me the historic water levels, which I have sent on to the secretariat. You'll see they'll bounce around quite a bit.

In the last sort of -- between 1996 or so, they've dropped about 1.2 metres and they've started to recover both last year and expect that they'll continue to recover this year, so I suspect the Commission members can get a printout of that.

It's a little hard to read on my Blackberry and make sure I was getting it accurate, so I flipped it over and we'll make this available to you.

**MR. LEBLANC:** Thank you very much.

**CMD 15-H2.15**

**Written submission from**

**Labourers' International Union of North America (LIUNA)**

**MR. LEBLANC:** So the next submission is from the Labourers' International Union of North America (LIUNA). It's CMD 15-H2.15, so H2.15.

**CMD 15-H2.16**

**Written submission from**

**International Brotherhood of Electrical Workers (IBEW)**

**Local 804**

**MR. LEBLANC:** The next submission is from the IBEW Local 804, CMD 15-H2.16.

**THE PRESIDENT:** This intervenor is quoting the report of Grimshaw and talking about this MOU between Ontario and Quebec. Any concern about that?

**MR. HAWTHORNE:** I wouldn't presume to comment on an MOU between Ontario and Quebec. I think the

point is that we -- you know, we have a role carved out for us in the long-term management plan, and what we are doing right is consistent with that.

It does include some degree of relationship with -- between the Province of Ontario and the Province of Quebec. I think we talked about that at the last hearing, but we don't see it as being material to our relationship.

**THE PRESIDENT:** I think it's paying a compliment that, according to this, you couldn't do an Ontario-Quebec deal without nuclear. That's what he's saying.

**MR. HAWTHORNE:** Yeah. I've always believed that there is an ability to create an interaction between Ontario and Quebec for reasons which I think I explained last time, which is that Ontario can supply Quebec in winter months when Quebec is very tight for power, and Quebec can reciprocate. And that's really the nature of the relationship.

But the way in which there is a surplus in Ontario is heavily driven by the high nuclear component in Ontario, so I think this intervenor just points out that that whole relationship only works if there is a stable base in Ontario which largely is provided now from nuclear.



**CMD 15-H2.17**

**Written submission from**

**Commissioning & Technical Services (N.A.) Ltd.**

**MR. LEBLANC:** The next submission is from CTS North America, which is CMD 15-H2.17.

**THE PRESIDENT:** Ms. Velshi?

**MEMBER VELSHI:** Question for Bruce Power.

This intervenor and many others have spoken about your high expectations when it comes to safety in the workplace, and not only is it a requirement for them to qualify, but you've actually helped them improve their safety performance.

Can you comment on that, and perhaps that are examples where people have actually been disqualified and you've taken them off your qualified supplier list because of their safety performance, and again talk about your corporate values around this, please?

**MR. HAWTHORNE:** Yeah. For the record, Duncan Hawthorne.

I think this is consistent with your corporate social responsibility as well. We have -- a number of years ago, working with the Safety Institute, we created what was called the CO Health and Safety Charter, which I founded. And the whole logic of that was large

corporations with mature and developed safety programs are capable of offering that support to smaller businesses.

And so what we actually did was we created this Charter. We've been funding it for a number of years, and we've invited small companies to participate and, in so doing, we share some of our well-developed programs and training so that smaller companies that couldn't develop their own have the ability to learn from our programs.

And not surprisingly, we then take that into our supply chain and say, really, if you want to appear on our supply chain, it'd be a good idea if you were signatories to the Health and Safety Charter because that builds the principle. So we've typically done that.

At the same time, our commercial services group do have a scorecard for all of our suppliers. We monitor their performance.

When we quote our safety statistics, we also quote the contractors who work on our site.

So it hasn't been necessary to have people crossed off the list because of that, but certainly there have been occasions when we've written to people saying that their performance is below our expectation and -- but it's more from a point of view of let's talk about how we can help you to improve.

But I think the CO Health and Safety Charter is right across Canada now, but it started here, and it started through our initiative. And it was then adopted by the Conference Board of Canada, and now you find signatories to it right across Canada.

**THE PRESIDENT:** Anybody else on this?

So just as a quick follow-up, so you rely on their training program because this company's sort of claiming there's been a lot -- about 20 of their own people, I guess -- to meet your requirement.

Do you ever check to see or you ever any -- do you ever audit? Because it also goes with the supply chain of all your contractors or suppliers or what have you.

**MR. HAWTHORNE:** Yeah. Obviously, one of the things that I think, as an industry, learning is control of contractors. I just have a comment on that.

If you look at industry events, it's the standards applied by contractors that's the availability, and so we do set very clear expectations on all of our contract documents about the training qualification, work and practices of contractors before they come on site.

We also put they have to be qualified through a general employee training system in order to come on site.

And that's both, you know, a standard-setting thing, but it's also cost effective. We want people to be trained and capable of going to work when they come to site, so we set the training expectations beforehand and we test those in advance of the employees coming to site.

**THE PRESIDENT:** Thank you.

**CMD 15-H2.20**

**Written submission from**

**Green Feet Forests and Gardens:**

**Ecological Goods and Services**

**MR. LEBLANC:** The next submission is from Green Feet Forests and Gardens: Ecological Goods and Services, CMD 15-H2.20.

**CMD 15-H2.21**

**Written submission from Municipality of Brockton**

**MR. LEBLANC:** The next submission is from the Municipality of Brockton, CMD 15-H2.21.

**CMD 15-H2.24**

**Written submission from Georgian Bay Forever**

The next submission is from Georgian Bay Forever, CMD 15-H2.24.

**THE PRESIDENT:** Again, I'm leery about asking this question.

This intervenor claims that the climate change representing a major threat to the Great Lakes, warming water, changes such as proliferating algae bloom -- or algal bloom. I don't know what this is. Change to the food web that supports fish population.

So really, the question is, is there any relationship between the so-called global change and the lake?

Now, this is a very hot topic now, so is there anything that's being, you know, in research on that?

I guess that's maybe Fishery and Ocean, Environment?

Again, we are not into the global warming file, but what we would like to see is are we looking at fish in the lake. That's the real interest, and the whole ecosystem that goes with water in the lake.

**MR. HOGGARTH:** So Tom Hoggarth, for the record, from Fisheries and Oceans.

Again, that is a huge and broad topic, and it is something that DFO does have science, and our science people, working on.

There's no easy answer. We all know that, as -- with the weather change that will affect temperatures within the lakes, could potentially be affecting -- again, the discussion we had earlier about water levels and that kind of stuff.

So we're looking at it and modelling on potential impacts, but it's beyond saying that we -- for us, the biggest concern is if there are water level changes and the potential impact that will have on coastal wetlands. The coastal wetlands are some of the most important sort of ecosystems within -- within the Great Lakes for the production of fish.

But again, most of it is a modelling exercise, and we're looking at it. I don't think there'd be any -- we'd be able to make any conclusions that the Bruce Nuclear plant is aggravating or having any impact on this.

**THE PRESIDENT:** Thank you.

**CMD 15-H2.26**

**Written submission from Bluewater District School Board**

**MR. LEBLANC:** The next submission is from the Bluewater District School Board, CMD 15-H2.26.

**CMD 15-H2.29**

**Written submission from Janey Edwards**

**MR. LEBLANC:** The next submission is from Janey Edwards, CMD 15-H2.29.

**CMD 15-H2.30**

**Written submission from Christine Walker-Petriw**

**MR. LEBLANC:** The next submission is from Christine Walker-Petriw, CMD 15-H2.30.

**CMD 15-H2.31**

**Written submission from**

**Millwright Regional Council of Ontario**

**MR. LEBLANC:** The next submission is from the Millwright Regional Council of Ontario, CMD 15-H2.31.

**THE PRESIDENT:** The intervenor here, I think, talks about the INPO study.

Just -- I think they're talking about this, right? This is 31?

**MR. LEBLANC:** Yeah, we are at 31.

**THE PRESIDENT:** Right. So my question is, how much -- how well known is the result of the INPO assessment of your plant?

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

I think we talked before about the confidential nature of the WANO review process. The way it works here is that because we're based in North America, we're subjected to a WANO review, but as an extra benchmark, if you like, we've also asked for a rating, which currently comes from the Institute of Nuclear Power Operations based on the U.S.

So typically, we wouldn't talk about the detail. It would be made public that we received an



industry excellence award which, you know, people can very quickly understand that that means that you're one of the top-rated plants in North America.

And so we have been able to say with some degree of caution that the site is -- was awarded a safety excellence award for operational safety and -- on the Bruce B units, but we haven't got -- you know, embellished on that because the whole process is intended to be highly confidential so it can be highly critical when required.

In order to give you a more complete answer to that is that WANO has already started a new rating system, and we've already rated 15 plants across the world. We will have rated 55 of them by October when we'll hold the WANO biannual general meeting in Toronto, and the intention here is that we would then benchmark across the world the plants.

It was one of the recommendations from Fukushima, so it allows for uniformity across the world. North American has been rating plants for many years, but the rest of the world didn't, so this is an improvement -- an enhancement to get that consistency across the world.

**THE PRESIDENT:** Thank you.

**CMD 15-H2.32**

**Written submission from Levitt-Safety Ltd.**

**MR. LEBLANC:** Next submission is from Levitt-Safety Ltd., CMD 15-H2.32.

**CMD 15-H2.33**

**Written submission from Lynn Horton**

**CMD 15-H2.34**

**Written submission from Judith Gaglani**

**CMD 15-H2.35**

**Written submission from Christina Vinogradov**

**CMD 15-H2.36**

**Written submission from Kristen Traherne**

**CMD 15-H2.37**

**Written submission from Rakka Gaglani**

**MR. LEBLANC:** The next five submissions are to the same effect. They are from Lynn Horton, CMD 15-H2.33, from Judith Gaglani, CMD 15-H2.34, from Christina

Vinogradov, CMD 15-H2.35, from Ms. Kristen Traherne, CMD 15-H2.36 and from Rakka Gaglani at CMD 15-H2.37.

I think this brings us to 9:30, and -- right. And we are going to stop here for today.

And anything you want to say to finalize and set us up for tomorrow?

**MR. LEBLANC:** Yes. In fact, we're going to start with interventions at 8:30 tomorrow morning, so we're going to continue, but now with oral interventions.

I would ask everyone that have taken interpretation devices, if any, to return them -- not forget to return them so you can get back your identification cards.

Thank you. Bonne soirée à tous.

--- Whereupon the hearing adjourned at 9:32 p.m., to resume on Tuesday, April 14, 2015 at 8:30 a.m. / L'audience est ajournée à 21 h 32 pour reprendre le mardi 14 avril 2015 à 8 h 30