Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public meeting

Réunion publique

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Le 26 mars 2015

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

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

Commission Members present

Dr. Michael Binder
Mr. Dan Tolgyesi
Dr. Sandy McEwan
Ms Rumina Velshi
Mr. André Harvey

Commissaires présents

M. Michael Binder
M. Dan Tolgyesi
Dr Sandy McEwan
Mme Rumina Velshi
M. André Harvey

Secretary:

Mr. Marc Leblanc

Secrétaire:

M. Marc Leblanc

General Counsel:

Ms Lisa Thiele

Avocate générale :

Me Lisa Thiele

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Ottawa, Ontario

--- Upon commencing on Thursday, March 26, 2015
at 9:03 a.m. / La réunion débute le jeudi
26 mars 2015 à 9 h 03

Opening Remarks

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

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

Des appareils de traduction sont disponibles à la réception. La version française est au poste 2 and the English version is on channel 1.

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

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

I would also like to note that this proceeding is being video webcast live and that archives of these proceedings will be available on our website for a

three-month period after the closure of the proceedings.

Please silence your cell phones and other electronic devices.

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

President Binder.

LE PRÉSIDENT : Merci, Marc.

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

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

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

I would like to begin by introducing the Members of the Commission.

On my right is Monsieur Dan Tolgyesi.

On my left are Dr. Sandy McEwan, Ms Rumina Velshi and Monsieur André Harvey.

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

MR. LEBLANC: The *Nuclear Safety and Control Act* authorizes the Commission to hold meetings for

the conduct of its business.

The agenda was approved yesterday. Please refer to agenda 15-M7.A for the complete list of items to be presented today.

Mr. President.

CMD 15-M10/15-M10.A

Oral presentation by CNSC staff

THE PRESIDENT: Okay, so the first item for today is an update on the Study of Consequences of a Hypothetical Severe Nuclear Accident and Effectiveness of Mitigation Measures, as outlined in CMDs 15-M10 and 15-M10.A.

We have representatives here from OPG and I understand that via teleconference we have representatives from the Office of the Fire Marshal and Emergency Management.

So let's test the technology. Mr. Kontra, can you hear us?

MR. KONTRA: Yes. We are here.

THE PRESIDENT: Okay.

MR. KONTRA: Good morning, Dr. Binder.

THE PRESIDENT: Welcome.

So let's start and I understand that Dr.

Patsy Thompson will make the presentation. Please proceed.

DR. THOMPSON: Thank you, Mr. President.

Good morning, Members of the Commission. My name is Patsy Thompson. Je suis la directrice générale de la Direction de l'évaluation et de la protection environnementales et radiologiques.

With me today are Mr. Andrew McAllister, the acting director of the Environmental Risk Assessment Division, and Ms Melanie Rickard, the acting director of the Radiation and Health Sciences Division. Mr. McAllister will make today's presentation.

We are supported by a team of CNSC staff with expertise in reactor behaviour and regulation and emergency management. Ontario Power Generation representatives are also present and available to answer questions. For this work, OPG was responsible for the dispersion modelling and the dose calculations.

You will recall that staff conducted the Study of Consequences of a Hypothetical Severe Nuclear Accident and Effectiveness of Mitigation Measures in response to direction from the Commission in the March 2013 Record of Proceedings for the environmental assessment of the refurbishment and continued operation of the Darlington Nuclear Generating Station. Our report was first presented to you on June 19, 2014 under CMD 14-M30.

Today's presentation provides an update on this study and is documented in CMD 15-M10. Addendum A to the CMD is a table of comments received during the public review period and staff's responses to these comments. Addendum B is the updated revised study report for your consideration.

I will now turn the presentation over to Mr. McAllister.

MR. McALLISTER: Thank you, Dr. Thompson.

For the record, my name is Andrew McAllister and I am the acting director of the Environmental Risk Assessment Division.

I will begin by providing a brief outline of our presentation.

As you can see, the presentation includes background information around the reason for the study and its approach as well as how the Commission and the public have been involved to date. This will establish the context for today's update meeting.

This information is followed by a discussion of how CNSC staff addressed the direction from the Commission when we were before you in June 2014 as well as the results of the public consultation on the draft study and how CNSC addressed the concerns raised during that process.

The presentation will wrap up with CNSC staff's conclusions and next steps.

The next few slides will cover off background information related to the study and what has been done to date.

In December 2012, during the course of the hearings on the environmental assessment for the refurbishment and continued operation of the Darlington Nuclear Generating Station, interveners raised concerns over issues such as the severity of the accident assessed, multi-unit accidents, adequacy of offsite emergency planning, including evacuation planning, and potential health effects to the public.

During the hearings, CNSC staff confirmed that the nuclear accident that was assessed for human health and environmental consequences was credible and sufficient for the environmental assessment. However, staff did indicate that a more detailed examination of a severe accident was possible.

Subsequently, in its March 2013 Record of Proceedings on the environmental assessment, the Commission directed staff to assess health and environmental consequences of severe accident scenarios and to update the Commission accordingly. The update to the Commission was to be in the form of an information document or equivalent.

We presented the draft study to you as part of CMD 14-M30 during the June 19, 2014 Commission Meeting.

This slide presents the high-level steps of the study that were undertaken to address the Commission's request.

Staff of the CNSC and Ontario Power Generation worked together to carry out the study. Ontario Power Generation, or OPG for short, carried out the work with regards to the identification and modelling of the release, including the dispersion modelling and dose assessment for unmitigated doses.

The results of this work, specifically the dose assessment, were provided to CNSC staff who then completed a human health risk assessment, specifically increased risk of cancer incidence, with due consideration of protective actions, and an examination of other consequences.

Some of the other consequences examined included implications to emergency planning, psychosocial effects and effects to non-human biota. When we use the term "non-human biota," we are referring to wildlife.

To ensure that the study was robust, a source term of a sufficient magnitude was needed, as was a wide range of release scenarios.

A "source term" is defined as the types

and amounts of radioactive material released to the environment following an accident.

For this study, it was based on the magnitude of CNSC's large release safety goal of 1 X 10E14 becquerels of cesium-137, was comparable in magnitude to the 10E-7 type of severe accident scenario discussed by interveners during the Darlington refurbishment environmental assessment and was 4-5 orders of magnitude greater than the actual accident assessed as part of the aforementioned environmental assessment. The source term examined in this study is significantly larger than would be expected under any credible scenario.

With respect to scenarios analyzed, two key aspects describe the scenario, namely the hold-up period and the release duration.

"Hold-up" refers to the period of time between the radioactive material being released from the reactor core to then being released into the environment. It is normally "held up" by containment prior to release in the environment.

"Release duration" is the length of time that the radioactive material is being released to the environment.

With respect to the hold-up period, or timing of the release, it was set at 24 hours for all

scenarios, which is consistent with our understanding of accident progression at Darlington. To put the hold-up period into perspective, for Fukushima, despite the catastrophic conditions caused by the earthquake and tsunami, the hold-up periods ranged from 23 to 74.5 hours.

With respect to duration, three release event durations were chosen: short, meaning one hour in length; medium, meaning 24 hours; and long, meaning 72 hours in length.

The scenarios, which we will refer to subsequently in this presentation, are referred to respectively as 24-01, 24-24 and 24-72. The generic large release was the same quantity of radionuclides released for each scenario, albeit in 1, 24 and 72 hours.

To put the release durations into perspective, the one-hour duration scenario would be comparable to a significant breach in containment, whereas the other two scenarios, the 24- and 72-hour durations, indicate partially or fully intact containment with venting occurring, for example.

As expected, a short-release duration of 1 hour of the entire source term would be more challenging to emergency response than the release of the source term over the medium and long durations examined in this study.

With respect to the last bullet, we heard

the concerns from interveners about the absence of a Fukushima type of release. Staff's position is that an accident like that at the Fukushima Daiichi Nuclear Power Plant is unlikely to happen in Canada, reflective of the CANDU design and the extremely low likelihood of an external event like the tsunami occurring near Canadian nuclear power plants.

However, to be responsive to intervener concerns raised during the hearings, the source term was increased fourfold for two scenarios to be comparable to a common cause event affecting all 4 units at Darlington at the same time. Note that this is a simple yet conservative way of looking at a multi-unit event. That is to say that if we used conservative deterministic and probabilistic safety assessments, the events leading to such a release at multiple units are either impossible or so small that they represent scenarios that are well below the ranges of concern and likely well below 10-8 per year probability.

For all scenarios, the release was in the form of a plume dispersed in the atmosphere.

Now to some of the key study assumptions.

A key assumption was to assume that radiological releases occur, meaning Fukushima enhancements such as emergency mitigating equipment were not accounted for and the source term was assumed to be released in its

entirety.

What does this mean practically? What it means firstly is that we have an accident scenario in this study that is comparable to a 10E-7 type of accident. If operator actions and Fukushima enhancements were accounted for, such as emergency mitigating equipment, the likelihood of a severe accident of this nature would be lowered even further by a factor of 10 to be in the range of 10E-8 or 1 in 100 million and be practically eliminated.

Furthermore, the amount of radioactive material released would be reduced if considerations for interaction between radioactive material, containment and other equipment are taken into account due to retention, plating and other chemical interactions. In short, the source term is significantly larger than would be expected under any credible scenario.

The second key assumption had to deal with the weather, specifically wind speed and direction. For the short-term release, referred to as the 24-01 scenario, wind speed and direction were constant. For the medium- and long-term releases, which were 24 and 72 hours in length respectively, variable wind speed and direction were used in the dispersion modelling.

Lastly, it was assumed that protective actions were implemented effectively. That meant that for

all individuals evacuated, meaning relocated to a safe area, they received 0 dose as evacuation was successfully done. For those individuals sheltered, meaning instructed to stay inside and take other measures such as closing windows, a dose reduction of 20 percent was taken into consideration.

Finally, for KI pill ingestion, it was assumed that KI pills are available to residents within the Primary Zone in advance of the radiological exposure and that ingestion is done in the timeframe prior to or immediately after exposure, resulting in a complete elimination of dose to the thyroid.

With respect to the human health results, the excess future cancer risk attributed to the radiation exposure from the accident scenarios was compared to the baseline future risk, that is, the risk in the absence of radiation exposure from the accident. The key study findings were that it would be nearly impossible to distinguish most radiation-induced cancers from baseline cancers examined in this study. That is all cancers combined, leukemia and adult thyroid cancer.

Of note, childhood thyroid cancer is the only radiation-induced cancer that could be distinguished from baseline cancers. Increased risk for childhood thyroid cancer was predicted for all scenarios. For

example, in the 24-24X4 scenario where the source term was increased fourfold, the predicted excess future risk of developing childhood thyroid cancer was an additional 0.3 percent above the baseline future risk of approximately 1 percent in close proximity to the plant.

This led to the study recommendation that the consideration of sensitive receptors such as children be an important aspect of emergency planning.

To recap some key milestones, the draft study was presented to the Commission during the June 19th, 2014 meeting. Concurrently, the draft study was out for public consultation. As requested during the Commission meeting and documented in the minutes of that meeting, CNSC staff was to update the Commission on the results of the public consultation.

The public consultation period ran from June 4, 2014 to August 29, 2014. The public consultation notice was published on CNSC's website and was also made available through CNSC's subscription list. The draft document was available in both official languages upon request.

A total of 59 requests for the draft study were received. Five-hundred and five (505) submissions were received on the draft study. Four-hundred and eighty-six (486) of them appeared to be part of a

letter-writing campaign organized by Sierra Club which focused on the severity of the accident assessed.

The remaining submissions came from members of the public, industry, non-governmental organizations, and provincial and federal government.

Industry comments came from Bruce Power, Atomic Energy of Canada Ltd., now known as Canadian Nuclear Laboratories, and Ontario Power Generation.

Examples of non-governmental organizations included Greenpeace and the Canadian Environmental Law Association.

The federal government comments came from Health Canada, and the Ontario government comments consisted of a joint submission from the Office of the Fire Marshal and Emergency Management and the Ministry of Health and Long-Term Care.

CMD 15-M10 is structured in three main parts:

- first, the body of the CMD itself, which is a high-level summary of the public consultation and CNSC staff responses to direction from the Commission and key concerns raised by the public and others;

- secondly, CNSC staff dispositions to the comments received during the public consultation period on the draft study which forms Addendum A;

- finally, the revised draft Study of Consequences of a Hypothetical Severe Nuclear Accident and Effectiveness of Mitigation Measures forms Addendum B.

The next few slides deal with how CNSC staff addressed the direction from the Commission, focussing on the key ones. Note that not all aspects are discussed in this presentation but all are addressed in the CMD.

The first direction from the Commission to be discussed is that around protective actions and protective action levels, or PALs for short.

This slide provides some context and shows that protective action levels are based on a dose or dose range that have been established for Ontario provincial nuclear emergency response.

The Ontario provincial nuclear emergency response plan is intended to be flexible and it is for this reason that the evacuation and sheltering PALs are reported as a range. For example, for evacuation it ranges from 10 mSv to 100 mSv whole body doses.

What does this mean from a nuclear emergency response? Practically, in the event of an incident, initial modelling and/or measurements will help predict doses at certain distances and those dose predictions are compared to the PAL values to help

determine what protective action may be needed.

In addition, there is the thyroid blocking PAL -- also known as potassium iodide pill ingestion -- of 50 mSv, which is in alignment with the international and national guidance. The Ministry of Health and Long-Term Care has responsibility when it comes to deciding on the administration of potassium iodide in Ontario.

The direction from the Commission on this matter was to look at what would happen to the risk estimates if there was a change to the doses used to implement the protective actions.

For the purpose of our study, we based hypothetical decisions regarding evacuation and sheltering on the lowest dose in a given range. For example, since the PAL for evacuation is 10-100 mSv, it was assumed that if doses were projected to be above 10 mSv, then the decision to evacuate would be undertaken. Using this PAL, 12 km was the greatest distance to be evacuated, which was analogous to the Primary Zone in this study for the 24-01 scenario. All other scenarios would require a smaller evacuation distance.

At the Commission's request to address the impacts of basing decisions on larger doses within the PAL range, we assessed the impact of assuming that evacuation would take place only at projected doses of 100 mSv and

above, and sheltering would take place at projected doses of 10 mSv or above. This analysis is presented in section 7.2 and Annex 6 of the report.

The results of this assessment indicated that the size of the area to be evacuated did not change or changed very little for all scenarios, with the exception of the 24-01 scenario. For that scenario, the size of the evacuation zone was reduced from 12 km to 1 km.

What this means from a health impact is that more of the population may receive a dose and individual doses may be higher, although not significantly. This would translate directly into a greater theoretical cancer incidence risk, albeit not one that would be distinguishable from background.

This would be useful information when balancing the radiological risk, meaning dose and resulting cancer risk, versus the non-radiological risk such as physical and psychosocial effects from evacuation when considering a protective action. These non-radiological risks have been found to be real, given the experiences from Chernobyl and Fukushima.

With respect to the scope, the study was updated to reflect that economic consequences were not assessed. This type of comment also came up frequently in the public submissions as CNSC staff dispositioned these

comments by indicating that it was outside the mandate of the Commission under the *Nuclear Safety and Control Act* and explained the legislation around nuclear liability in Canada.

For the next bullet, references were added throughout the document, including to the information boxes where appropriate such as health effects from Chernobyl and Fukushima.

For the variability in human health risk estimates, CNSC staff have included in the risk tables at Annex Three of the draft document the lower and upper 90 percent bound estimates that the radiation risk assessment tool known as RadRAT produces. As indicated in this slide, using the upper 90 percent bound risk estimates, similar results were observed; namely the childhood thyroid cancer was the only cancer examined for which increased risks were observed on the order of two to two and a half times greater than that of the mean estimate.

For example, the excess risk of developing thyroid cancer for a child from the worst scenario, namely the 24-24 times four scenario in close proximity to the plant yielded a mean excess future risk of 301 chances and 100,000, whereas the upper 90 percent bound risk estimate was 773 chances and 100,000 and the lower bound risk estimate is 75 chances in 100,000 and all of this is

relative to the baseline future risk of 1,078 chances in 100,000.

In order to improve on the readability of the document, CNSC staff have corrected the discrepancies, ensured consistent use of terms throughout and added an extended plain language executive summary and an acronym list. The draft document will go through an additional review prior to publication.

As part of the minutes of the Commission meeting, there are commitments by CNSC staff to produce two fact sheets. The first one, a fact sheet on health effects of the Chernobyl accident was published on CNSC's website on February 18, 2015. This fact sheet was based on the related United Nations Scientific Committee on the Effects of Atomic Radiation Report. All the information is objective, substantiated and scientific.

The second fact sheet on managing public dosage during a nuclear emergency is pending publication. It addresses the questions and facts surrounding regulatory dose limits and dose based protective action guidelines. In conclusion, as outlined in CMD 15-M10, all of the directions from the Commission has been addressed.

The next few slides will now focus on the key concerns raised during the public consultation period and CNSC staff’s responses to those concerns, including the

changes made to the study document. Note that not all concerned are discussed in this presentation and the CMD, but all comments are addressed in a disposition table that forms Addendum A of the CMD.

Certainly the number one concern raised was around the severity of the accident. There were comments around different aspects of this, namely it wasn't a Fukushima type of accident; it was not an international nuclear event Scale 7 accident or INES. The INES scale refers to the International Atomic Energy Agency tool for communication to the public on the safety significance of events associated with ionizing radiation and it wasn't a multiunit accident.

CNSC staff's position is, in fact, the predicted dosage from the study are comparable to those measured at Fukushima and we will look at some of those actual numbers later in the presentation. INES is meant to be a communication tool. It is not meant to be for comparisons between facilities, organizations or countries, as some commenters are advocating.

Further, Fukushima enhancements would reduce the probability of a similar accident happening to the 10 to the -8 range and given all reactor safety enhancements installed in Canadian nuclear power plants in response to lessons learned from the Fukushima accident,

the release of radioactivity of this magnitude, such as the INES 7 or Fukushima is extremely unlikely, meaning an unimaginable natural disaster would have to occur. As the purpose of the study was to examine human health consequences, a highly unlikely generic scenario was assumed in the study that was reflected of a severe accident.

For the purposes of this study, multiple unit accidents were looked at in a conservative manner by multiplying the source term by four. It was recognized that there is ongoing work to develop a site-wide probabilistic safety assessment and associated safety goals that will provide a more realistic perspective of multiple unit accidents, their probabilities and associated risks.

Lack of an early release scenario was highlighted by a number of commenters. CNSC staff's position is that the 24 hour hold-up period is consistent with the current understanding of the release timings at the Darlington Nuclear Generating Station, taking into account containment and the vacuum building functioning as designed. The accident sequences in the Darlington Probabilistic Risk Assessment have an early release component, are in the range of 10 to the -7. Consideration of Fukushima enhancements such as emergency mitigating equipment it is expected that probabilities will be further

reduced to the 10 to the -8 range.

When drawing comparisons with Fukushima, it is important to note that the large earthquake and resulting tsunami did not create these kinds of early release conditions, rather releases were held up in the different Fukushima units for different periods of time, ranging from 23 to 74 and a half hours, with releases not occurring simultaneously across all units. As the purpose of the study was to examine human health consequences, again a highly unlikely generic scenario was assumed in the study.

Another concern raised with respect to the lack of assessment of effects on aquatic biota like fish and drinking water. Additional information was added to the document; explained that given the airborne pathway of the hypothetical release, considerations were given to the effects to terrestrial base biota such as mammals, which are more radio sensitive compared to aquatic biota such as fish. No acute effects are expected to terrestrial or aquatic biota in the hypothetical scenarios examined. With respect to drinking water, there are provisions in place at the federal and provincial levels for emergency planning on this matter. The bottom line is that drinking water would be protected.

In the original draft document, the use of

the 95th percentile dose was described as a maximum dose to be experienced by a very small fraction of the population. However, while a 95th percentile dose reflects an upper bound, it is less of a function of the population or its distribution, but rather is tied to the worst-case meteorological conditions seen at a particular location during the calculation. This could be, for example, in an area with either a very small population or a very large population. The staff recognize the need to correct the way this concept was described in the document and CNSC staff replaced the 95th percentile doses with centreline doses to represent the maximally exposed individual. The centreline doses were slightly higher than the 95th percentile doses in the scenario that resulted in the highest doses, that being the 24-01 scenario and was judged to be more conservative in this respect.

Various parties had different views on the use and applicability of the study, such as its applicable to emergency planning, the use of conservative and non-conservative assumptions, and the absence of a consideration of longer-term risks, meaning those greater than seven days. CNSC staff's position is that the study is meant to address the direction given to them by this Commission. It was not designed for other purposes. Though the study results are useful in support of other

initiatives, they are not meant to represent specific reactor actions scenarios nor be part of the actions emanating from the Fukushima action plan or activities being undertaken by other parties such as updating of the Nuclear Emergency Response Plans.

Wherever possible, additional information and clarity was added to the study assumptions, methodologies, et cetera, to ensure sufficient transparency for parties that may wish to use the information in the study for other purposes. For example, more detailed short-term information was added.

The study focused on the risks from the first seven days, which is reflective of the early phase of an accident and is in alignment with national and international guidance as a necessary and appropriate timeframe to take early protective actions. The exposure incurred over the first seven days could make up the bulk of the dose experience in the first year, depending on the emergency measures taken. CNSC staff are developing regulatory guidance on post-accident recovery. As such, risk assessment considerations that go beyond the early phase, which is reflective of seven days in this study, will be considered as part of that future work.

In response to comments raised on the lack of recent information on Fukushima, CNSC staff did a

literature review and integrated the latest information as appropriate such as measured dose information. A number of studies have reported on measured doses and using dose to the child's thyroid as an example, estimates range from 23 to 50 mSvs. To put that into perspective, for the 24-24 times four scenario considered in this study, the average child's thyroid dose was 31 mSv's, which was within the ranges reported to date related to the Fukushima event.

One of the key recommendations from the draft study was that further consideration of sensitive receptors in emergency planning may be warranted given the childhood thyroid cancer results. Several commenters indicated that sensitive receptors such as children are already a main focus of emergency planning. For example, Health Canada indicated that its guidelines for intervention are derived based on the most sensitive age group using parameters recommended by the International Commission of Radiological Protection.

Similarly, provincial authorities integrate sensitive receptors in emergency planning; for example, the Ontario Ministry of Health and Long-Term Care's Potassium Iodide Guidelines. Given this feedback, CNSC staff added text on how federal and provincial authorities consider sensitive receptors in emergency planning and emphasize the importance of its continued

consideration given the study's findings.

Concerns were raised around the choice of the risk acceptability framework that was examined, the dose inputs used to put risk into perspective, and finally the absence of a radiological type of framework. It should be noted that multiple frameworks for the assessment and management of health risks, associative exposures to contaminants have been developed worldwide. For example, we have profiled a framework used by Health Canada for contaminated sites and by Health Canada and international organizations for commercial chemicals. Additional information was added to the document to provide this context, including work done between the Atomic Energy Control Board and Health Canada. Further information around radiological protection frameworks such as those from the International Commission for Radiological Protection were added.

The conclusions on risk acceptability did not change. For example, the doses predicted from the study are below the International Commission for Radiological Protection's recommended reference levels of 20 to 100 mSv dose to a member of the public during emergency situations. However, CNSC staff continue to believe that a public health type of framework provides transparent risk information that could be used by

decision-makers and is more easily understandable by the public because cancer risk could be better contextualized than a dose range.

The next two slides will highlight CNSC staff's conclusions and next steps. I will now turn the presentation back to Dr. Thompson.

DR. THOMPSON: To conclude, this update in the form of CMD 15-M10 and its addenda addresses the Commission's direction to CNSC staff to seek and incorporate public comments on the draft study, as well as to describe how the Commission's direction on the document was integrated. The document has been improved as a result of public consultation and direction from the Commission and staff's assessment of some of the key concerns raised did not need changes to the document. However, the disposition of those types of comments in Addendum A provides a transparent explanation to stakeholders as to the reasons why.

The next steps will be to finalize the study based on any additional feedback from the Commission and publish the study on the CNSC's website. Concurrently, work will be undertaken to publish the results in the peer-reviewed journal.

This concludes our presentation and we are available to answer questions.

THE PRESIDENT: Thank you. Before we get into the questions by Commissioners, I understand OPG would like to make some comments.

Ms Swami, over to you.

MS SWAMI: Thank you, Dr. Binder and Members of the Commission.

My name is Laurie Swami, Senior Vice President, Decommissioning and Nuclear Waste Management.

I would like to thank you for the opportunity to make a brief statement about the importance study that the CNSC staff has undertaken. We believe it is one of the most comprehensive studies looking at the potential human health effects of a hypothetical severe nuclear accident ever undertaken in Canada. OPG would like to commend the staff and congratulate them on the work that they have completed. OPG did provide support to this project, as did other agencies, departments and specialists.

The study, we believe, characterizes the potential for an increase of -- characterizes the potential fairly well as very small or essentially not measurable against the natural background occurrence of cancer in Canada. Suggestions for enhancing risk estimates for sensitive receptors are identified. OPG supports the study conclusions that the risks are being effectively managed in

alignment with international risk frameworks. Further, OPG believes the study addresses the Commission direction from the Darlington refurbishment for continued operation environmental assessment hearing.

We look forward to seeing this report published because we believe it will give the public an opportunity to further understand the safety aspects of licensed facilities in Canada. Thank you.

THE PRESIDENT: Thank you.

So why don't we then jump into the question session with Ms Velshi?

MEMBER VELSHI: Thank you, Mr. President.

I would like to echo some of the comments you heard from OPG to CNSC staff on what is, I believe, to be a very comprehensive study. I looked back at the transcript from the December EA licensing hearings for Darlington refurbishment again to get a refresher on what the genesis of the action was and I think the key findings from the study should give the public a lot of comfort, that even when one takes such a very unlikely incident of the likelihood of such a serious accident, that the impact of that is very small except for the sensitive members of the population, but that it's not really measurable about background.

So as we were looking at why we needed to

do the study it was really to address a lot of concerns we were hearing that the EA had not looked at these really black swan events and so I think -- I'm hoping that this would give them that reassurance.

My questions are more around your responses to questions that have come up. So one is around the sensitivity cases that were done. Explain to me why for the 24-01 you didn't do the times four for that one, given that that is the scenario that seems to have the greatest impact when you look at things like evacuation, and so on?

MR. FRAPPIER: Gerry Frappier, for the record. I am the Director General, Assessment and Analysis.

So we are looking at a hypothetical accident scenario and that's how it was undertaken, but at the same time we have to have some sort of logic to things and so the view was that having a multiple incident happen, you know, exactly at the same time, all of it happening in that short period of time was not an appropriate scenario to look at that. Things would develop with time. That is the experience we have everywhere, and that is what all the modelling shows, and so that to have the four reactors releasing there would need to be, just from a physical perspective, some time between those.

DR. THOMPSON: Patsy Thompson, for the record.

If I could add, one of the considerations -- and this was explained in some detail last June during the hearing -- is for the release during one hour from four reactors essentially are looking at the complete containment failure of the four units all at once. From that point of view it was considered to be not credible.

And so the approach we have taken is to look at the four units experiencing an accident from a common cause, but looking at them more appropriately with some kind of containment and other systems functioning during a period of time which is more reflective of the safety systems in place.

THE PRESIDENT: Can I jump on this one? So throughout the whole study you are trying to be scientific, use numbers, et cetera, and sometimes when we want numbers we are getting the kind of explanations is not credible, et cetera.

Why couldn't you estimate what the probability would be for the scenario Ms Velshi just asked about for the four units to release all the content in one hour? Are you talking about now 10 to the -10 and that's why it's not credible? I mean I don't understand why in

some of those scenarios you did not use the frequency number to say this is not credible because we were looking at 10 to the -7.

You know, I don't understand why you did not attempt to do -- to put some numbers on these.

MR. FRAPPIER: Gerry Frappier, for the record.

It's a good point. I think that the reality is we are now getting two scenarios that are so, so low that we really don't have numbers for that. We know it is way below, let's say, 10 to the -8, like you said, that we are sort of using a little bit as an indicator of practically eliminated.

THE PRESIDENT: But if you just said that, below 10 to the -8, then it explains better why you did not use it because, you know, then you are -- because you set out to do a 10 to the -7, which is a kind of a Fukushima level, if I understand correctly. Then everything else was not a credible scenario then to study.

I'm trying to see whether we can actually -- when we neglect something there is a good, again, numerical reason why we are doing it.

MR. FRAPPIER: So I would not disagree with you. The fact, though, is that we don't have those numbers because we haven't put the effort into getting them

because they are so small. So to put numbers out there, we know they are lower than -- it’s easy to say, but to really get to exactly what that number is would require some effort that we did not do.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: My second -- it's more a comment -- is really to reiterate what you have heard from the public where you have mixed very conservative assumptions with ones that are not conservative and it somehow -- not somehow. I actually brings questions to the overall credibility of the study.

So for assumptions around evacuation and KI pills for instance where it assumed 100 percent effectiveness or compliance, it just -- I mean you have heard it from the experts themselves, too, not only how realistic is that, but it just takes away from an otherwise really good study.

So I just wanted to keep it up there. I don't know if you have any more to say. I know you responded to those comments.

--- Pause

MR. McALLISTER: If it's all right, Ms. Velshi, I would just like to comment on that.

We noted those same comments and what we found was we were getting concerns raised by the broad

spectrum of groups that commented on the document. Industry was indicating that, well, if there was a multiunit accident, emergency planning wouldn't unfold like you did in your study. We heard from nongovernmental organizations about the severity of the accident assessed. Some of the provincial authorities were questioning some of the assumptions. That gives us comfort that we probably found the right balance so we were kind of hearing it from people of different views in society around nuclear.

As well the sensitivity analysis that we did, we thought, went a long ways to addressing some of those concerns where we heard what, I believe, Monsieur Harvey raised during the June 2014 meeting around how sensitive are these and we did an analysis that again showed us that for one scenario there was certainly a change from an emergency protective action perspective, but the rest was really very little change. So we felt that we found the right balance given what the study's intent was.

MEMBER VELSHI: Maybe for this round the last question is to the Ontario Fire Marshal Emergency Management folks.

What, if anything, are you going to do with this study? Does it give -- provide any value to you and help you in your emergency management planning?

MR. KONTRA: Thank you very much for that

question. This is Tom Kontra from the Office of the Fire Marshal and Emergency Management, for the record.

We found, similar to OPG's comments, that this is a very detailed, thorough and very helpful study that we can use in part with many other sources to help review our plans, which we are currently doing, and to review the planning basis and the actual parts of the plan as it applies. So we are very happy with the study overall.

MEMBER VELSHI: And the specific finding about the sensitive populations and children, anything different you would do as a result?

MR. KONTRA: Our preliminary look at the study and our current plans indicate that the study supports our current view on that particular aspect.

MEMBER VELSHI: So that means it really doesn't change what your current plan calls for then?

MR. KONTRA: I wouldn't want to say that because we are in the process of doing that review. So because we are not just using this study but we are using other information to complete the review, it would appear at the moment that the study itself is not going to change it, but that doesn't mean that we will not change.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Thank you.

Monsieur Harvey...?

MEMBRE HARVEY: Merci, Monsieur le Président.

The slide 20 when you mentioned that "explanation added regarding how emergency protective actions would ensure protection of drinking water", what has been added as information? Just to say that to protect drinking water we stop people to drink that water and we provide other means, is that the kind of answer or information you added?

DR. THOMPSON: Patsy Thompson, for the record.

It's probably a poor choice of wording. Essentially the process that is in place is if there is an event there is a notification process in place. There are between OPG and the province agreements that if there are certain values being released there is notification to the drinking water supply plants and they take measures to essentially shut the valve, so you are protecting the drinking water system from contamination. So that is more what we intended.

But the additional information is that in the scenario that we assessed there was no large release of contaminated water to the Great Lakes so there would not be a pathway to contamination of drinking water.

MEMBER HARVEY: Okay, thank you.

Slide 22. We just talked a few minutes ago about the emergency planning basis. When you say that it "provides insights to emergency planning, but was not meant to address, for..." could you just elaborate on that? I think it's about the EMS. Slide 22 where it says "provides insights to emergency planning..."?

DR. THOMPSON: Patsy Thompson, for the record.

Essentially what we are saying here is that -- and when we did the work originally, put the report out for comment, we received feedback in terms of the usefulness or not of the study in terms of providing guidance for updating emergency management plans. And so as the Office of the Fire Marshal have just mentioned, they will not be using this study on its own, but they will consider it with other sources of information. So because the comments were coming in terms of, you know, if you hadn’t done it this way it would be useful for this, if you had done it this way it would be useful; so what we have clarified essentially, we did not do the study to help in review of emergency plans. We did the study to address public concerns during the EA Commission meeting -- Commission hearing.

But for those who may want to use the

study we have clarified our assumptions so that it is more transparent, so that if they will use -- if they want to use the report there is more information to guide on how the results were obtained.

MEMBER HARVEY: Some nuance. If you use it --

DR. THOMPSON: Probably, yes.

MEMBER HARVEY: If you use it, it's kind of a basis for the planning. If you look at it, you use it in a way. Anyway, okay. I catch it, but I keep my nuance.

DR. THOMPSON: Perhaps -- Patsy Thompson, for the record.

Monsieur Harvey, on pourrait regarder la façon dont on a répondu pour peut-être un peu clarifier cet aspect-là.

MEMBRE HARVEY : C'est un peu comme la protection de l'eau aussi. C'est que ce n'est pas tellement l'eau qu'on protège comme la source.

DR. THOMPSON: Okay. So perhaps what we will do following the Commission meeting is review how we have responded to make sure that the intent is clear and the way it's worded.

MEMBER HARVEY: Last question for now, just coming back to that 100 percent of protection, it would have been difficult to have another scenario for,

say, 75 percent and things like that, because that would have been a sort of sensibility analysis, because even the people responsible for the evacuation have some -- talked about the capacity of having 100 percent.

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

So when we looked at what assumptions to make we did look at the study that was conducted to support the environmental assessment where it was an evacuation time study that looked at the feasibility of evacuating the population around the plant, even in fairly bad weather conditions. But the time estimate was lower than the 24 hours that we have chosen. That was one input.

What I would say as well is that following the June Commission meeting when we looked at the sensitivity of evacuating, for example, at 10 mSv and then we looked at 100 mSv, that would essentially cover the range of the “what if” scenarios, what if it is not 100 percent effective and you get maximum dose essentially.

So by doing the sensitive analysis that the Commission requested I think we have covered that and perhaps it's something that we can explain better.

MEMBER HARVEY: Maybe the Fire Marshal could answer that question. It's about do we have many examples? You mentioned Fukushima that has been evacuated

in an appropriate time, but do we have many examples of evacuations that could support such a study?

MR. KONTRA: It's Tom Kontra, for the record.

If I understand the concern correctly, I support what Ms Thompson has just indicated, that the current studies would put the evacuation time well below the 24 hours, so it's just a question of decision-making time and we certainly have the decision-making processes down. And if you add decision-making time to evacuation time it still comes in under 24 hours.

MEMBER HARVEY: I see, okay.

DR. THOMPSON: Patsy Thompson, for the record.

Perhaps when the time estimate study was done it took into consideration experience from the States for example, with Katrina, and so perhaps OPG could explain the ground -- the models that were used for the study.

MS SWAMI: Laurie Swami, for the record.

I am going to ask John Peters to provide an overview of the studies that we did complete when we did both Darlington Evacuation Time Estimate studies, as well as the Pickering studies and the process that we used was to hire U.S. experts in this area to make sure we were using the best models possible. But John can explain more

of the information that we used.

MR. PETERS: John Peters, for the record.

I will just briefly highlight that in the U.S. examples there is a process. There is a very detailed methodology that must be followed, and has been studied and tested and it is updated routinely as a result of all kinds of different evacuations, whether it be response to weather; fire, floods. These are all considered in the work that is done and the U.S. Regulatory Commission requires this kind of study to be reproduced in new U.S. nuclear plants on an ongoing basis.

We selected that Code. We selected the experts who run those Codes and designed them for U.S. examples and we had them modify the work to match the Pickering and Darlington scenarios for the population, the layout of the community, et cetera, so the numbers you get match and can be compared with the U.S. examples that are current.

MEMBRE HARVEY : Merci.

THE PRESIDENT: Thank you.

Dr. McEwan...?

MEMBER McEWAN: Thank you, Mr. President.

On page 108, annex 4, you say, "high doses and dose rates and low doses and dose rates have the same biological degree of harm". Can you explain the difference

between dose and dose rates and why you made that assumption?

--- Pause

MS RICKARD: Melanie Rickard, for the record. I am the Acting Director of the Radiation Health Sciences Division.

This is based on assumptions that are embedded in the tool that we used, RadRAT. So you are probably aware that the large pool of data that we have in terms of health impacts comes from the lifespan study for the atomic bomb survivors and those of course were acute exposures, very high dose rates. So in a lot of studies that have been carried out with regard to EPI studies there is a doubling dose rate effectiveness factor that is often used in order to account for the fact that in the exposures that we see today they are often low-dose chronic exposures.

So I believe the statement stems from the fact that the approach used in RadRAT excluded the use or modified actually the concept of this doubling dose rate effectiveness factor. And that is actually described as a source of uncertainty in the RadRAT tool.

MEMBER McEWAN: Okay. And the difference, just for sort of public education, the difference between dose and dose rate?

MS RICKARD: My apologies. Melanie Rickard, for the record.

So the dose rate would be the dose delivered per unit of time and the dose would be the cumulative dose that was received over a set period of time. So, for example, we looked at the dose over a seven-day period so you could call it millisieverts per week if you wanted to, but since we describe the seven-day period, we refer to it in terms of dose. And of course often, you know, in occupational exposures for example we talk a lot about dose rate, the high or low dose rate fields usually in millisieverts per hour.

But in the context of this we are really talking about acute, highly acute exposures versus exposures that are received over a period of days, and in this case a week.

MEMBER McEWAN: And is there any effect in that dose rate curve to the long tails of the curve after the week? Does that contribute significantly to the total cumulative dose?

MS RICKARD: I think it depends. In this particular case we didn't go beyond the seven days. We didn't look at that period.

But we know that depending on how protective actions are taken that the doses that are going

to be received likely after the first week are going to be, how can I say it, much more chronic in nature, so smaller doses over several really weeks, months and years, and at those doses we wouldn't see -- we wouldn't see a huge impact on the results, the health implications.

MEMBER McEWAN: And then just keeping the same part of the document, nonhuman biota, you don't mention birds and I know that a lot of the Chernobyl work has been long-term follow-up on the bird populations.

MR. McALLISTER: Andrew McAllister, for the record.

When we look at sort of the spectrum of radio sensitivity, the more simple the organism, the less radio sensitivity it is or microbe. We referred to mammals, but mammals and birds are similar in that respect.

The work that is ongoing in Chernobyl that is certainly an area of active research on more sort of the chronic effects that may arise to nonhuman biota as a result of those kinds of exposures. As I said, it is still an area of further work.

And the latest United Nations scientific committee, “The Effects of Atomic Radiation”, its latest report, flagged or looked at that in a bit more detail and highlighted that. It was an area of uncertainty. The research was continuing and there could be localized

effects, but they would expect that sort of the immigration of animals in and out of the study area would offset those sorts of expected impacts.

THE PRESIDENT: Okay. Thank you.

Mr. Tolgyesi...?

MEMBRE TOLGYESI : Merci, Monsieur le Président.

On page 21 you are talking about, in the Table 3.2, selected radionuclides released. I suppose these are these three, cesium 134, 137 and iodine 131 which have the most impact on the health.

Now, in the case of Fukushima, these values are measured. They are not estimates?

--- Pause

MR. FRAPPIER: Gerry Frappier, for the record.

So if I understand your question, you are wondering about the composition of the radio nucleotides?

MEMBER TOLGYESI: No, what you -- you are saying in the study that the actual measured -- in Fukushima measured concentrations were lower than estimated models, okay, so that's why I'm asking.

My first question is that if this is estimated or they are real measured concentrations?

DR. THOMPSON: Patsy Thompson, for the

record.

So, Mr. Tolgyesi, Table 3.2 on page 21 --

MEMBER TOLGYESI: Yes.

DR. THOMPSON: -- there is actually the source term, what came out of the reactor.

MEMBER TOLGYESI: Okay.

DR. THOMPSON: In terms of your question relative to modelled versus measured, that is for doses to people and I can ask Melanie Rickard to provide some information in terms of the difference between the model and measured doses.

MS RICKARD: Melanie Rickard, for the record.

So in reality it is a combination of both. A lot of the air concentrations were estimated through models, but there were a lot of measurements taken of ground deposition of radionuclides, for example radionuclides that might be in the food supply. Ambient dose rates; for example, models combined with those measured values were in some cases used to estimate doses to the larger population and in some cases members of the public had direct exposure, direct dosimetry that was used. That was less common.

However, when the direct measurements were taken they were considerably lower than those that had been

estimated from the combined measured environmental contaminants with the modelling.

MEMBER TOLGYESI: Because what I -- in the Executive Summary you are saying that the actual Fukushima measures are comparable to estimated doses in this study. Now, when you are looking at 1.8×10 to 16 and 1.3×10 to 14 is it a kind of comparable estimate, because it is about 100 times the difference on that?

DR. THOMPSON: Patsy Thompson, for the record.

Mr. Tolgyesi, you are actually looking at two different things and so the Table 3.2 is the source term. The Executive Summary refers to people doses.

MEMBER TOLGYESI: Okay.

DR. THOMPSON: And so if we look at the report done by the United Nations Scientific Committee on Effects of Atomic Radiation on Fukushima, the doses that have been validated through measurements are in the range of the doses that we estimated from the study for the seven-day period.

MEMBER TOLGYESI: Now, I'm going to the Executive Summary again, page iii where you are saying that according to conclusions of the study, evacuation up to 3 km would be needed only and 12 km for the worst case scenario. Now, when you are looking, how should the

general public be insured when Fukushima -- I'm not even talking about Chernobyl -- accidents required several tens of kilometres to evacuate the population? We are talking about 3 to 12, so how should you present that to the public that they will have a kind of full trust?

DR. THOMPSON: Patsy Thompson, for the record.

Our confidence in the estimates for the zone to be evacuated in the situation that we have assessed, which is a hypothetical severe accident around the nuclear -- the Darlington site is based on the robustness of the modelling that was done, the dose estimates in the health risks. In looking at the dose estimates, the range of dose estimates from the hypothetical accident and looking at the protective action levels in the Provincial Emergency Response Plan, that combination gives us that range. And if we look at then the dose estimates from our study and compare them to the dose estimates -- the doses from the Fukushima accident, they are within the reasonable range for that type of severe accident and so on that basis we are confident in the results and the data that we obtained.

MEMBER TOLGYESI: I agree with you that based on all that you have a position that it's enough this zone to evacuate, but what I'm saying is how to explain

that, transmit that to the public that they will well understand your scientific reasons?

DR. THOMPSON: Patsy Thompson for the record, perhaps what we could consider in terms of -- I don't know if it's an information box or some other vehicle is to explain for example the basis for the decisions to evacuate at Fukushima. The decision to evacuate for example I believe was up to 20 km. There were reasons in terms of the state of the reactor and, you know, the time to essentially put people away from the event. So it wasn't just based on dose and so we could perhaps provide a little bit more information in terms of, you know, in our study the decisions are based on the doses and the protective action levels, in Fukushima they were based on other considerations and, for example, at the -- in Chernobyl, there were a number of other considerations in term -- and also, the -- you know, the delay in the decisions made by the government to evacuate people, so the scenarios are quite different and the situation in Chernobyl and Fukushima are also quite different.

MEMBER TOLGYESI: And --

THE PRESIDENT: In fact, I don't know. You shouldn't be afraid to say in -- in Fukushima, they didn't know the dose for days. And we remember because Canada and U.S. had to come with our own

evacuation level, so they were doing a decision on evacuation without any dose data at the time and a protective measure which was our international standard on the assumption that it's a severe accident. It was not based on actual dose.

We were struggling with this. Remember, the Americans and us came up with a 50-kilometre zone. And we can get into a whole conversation about how that was calculated.

MS RICKARD: Yeah, can I add something just to that? Melanie Rickard, for the record.

As -- just to follow up on what Dr. Thompson said, in the framework for emergency response, including recommendations from the IAEA, it's very clear that decisions based on -- protective action decisions, excuse me, can be based on what's called generic criteria, and those are criteria that are based on plant -- the state of the plant and plant conditions, so -- in fact, I think I'm using the wrong exact term. It's not generic criteria. That escapes me.

But they're a series of indicators at the plant that, if these indicators are met, then it might be good reason to go ahead and evacuate or what have you regardless of whether your dose modelling has

been complete, or measurements have been taken.

And so that's very well accounted for in the international framework.

And like Dr. Thompson said, I think we should probably make that clear in the report as well. There's quite a bit of flexibility involved.

MEMBER TOLGYESI: And on the same page, it's inside in Conclusions, and second paragraph, to make sure -- because we are discussing about the study is focusing on the health effects and hypothetical accident. And the second paragraph might be instead of further what they study, I will add that considering that the study is focusing on the health effects of a hypothetical accident, it does not take in account and whatever, whatever, whatever, to make sure, you know, you combine both of them.

THE PRESIDENT: Okay. Ms Velshi?

MEMBER VELSHI: I have a question and then a suggestion for your consideration.

So the question is, the applicability of this study to, say, the Bruce nuclear plant, can one draw any conclusions to say, hey, it's -- and I don't know what the wind directions are, but it's got a smaller population and evacuation will be easier and whatever else, that we don't expect harm to be any

more severe there than here.

I mean, can one draw any conclusions like that?

DR. THOMPSON: Patsy Thompson, for the record.

Given the hypothetical nature of this severe accident and the large source term that was used, the -- you know, a similar source term projected on the Bruce site with the information we have on evacuation time estimates, the dispersion modelling, the doses to individuals would not be any higher than they are. And given the -- well, the size of the protected areas, there's actually very few people within the first kilometres of the plant, and so the number of people affected and the requirement to evacuate would be much less.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Can I piggyback?

You see, I would like to turn it around completely. If we look at Bruce, what I would like to hear is that in the emergency plan around Bruce, they've looked at 10^{-6}, 10^{-7}, calculated what kind of a probable release might be in such a scenario and they've taken all the measure to deal with those things.

In other words, this gives you a good kind of benchmark to gauge how you -- what you should do in emergency -- on emergency planning and emergency management.

So there's always, in their own PSA, et cetera, they should make sure that they've actually looked at such severe accidents.

Am I --

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

Emergency plans have -- you know, a planning basis accident that is considered to develop the plan and perhaps Mr. Sigouin could add some details or the office of the Fire Marshal, who's on the phone.

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

I'll give you a little bit of information, then turn it over to Mr. Kontra, who can add to that.

But the emergency planning arrangements, the emergency plans in Ontario, are based -- for all the nuclear power plants are based on a generic accident planning basis, as Ms Thompson

mentioned a while ago.

So whether the accident occurs at one of the OPG facilities or the Bruce facility, the emergency planning zones and emergency arrangements are similar in nature and we could expect that the results from the study would yield similar numbers.

Maybe Mr. Kontra can confirm that and make reference to the planning basis that was used for the provincial nuclear plant.

MR. KONTRA: Tom Kontra, for the record.

I certainly agree with Mr. Sigouin. I would also remind us all that we, in addition to OPG and Bruce, also plan for Chalk River and Fermi 2, and our planning basis is similar but, more importantly, our plans are aimed at consequence management and we base those decisions on the projected or actual event at the time.

With our decision-making process and with the hold-up ability in the OPG and Bruce, we're confident our plans are sufficient regardless of the magnitude of the incident at the time but, as we have stated earlier, we are in the process of reviewing that.

THE PRESIDENT: I think I didn't ask

the question or didn't make the comment clear.

If we look at a plant coming to us now for licence renewal, remember we've argued that we would like now to assess -- I used to call it -- I'm still calling it doomsday scenario. To me, that's a 10^{-7}, I think, is what it said.

So I will expect to get some data saying we've looked at 10^{-7} and, with all the mitigation and all the things we've put in place, here are the consequences. I would expect, in particular, every new application to us will get that analysis. That's what we got the PSA and the deterministic, et cetera.

That's what I would expect to see from a study -- the lessons learned from a study like this.

Is that a reasonable expectation?

MR. FRAPPIER: Gerry Frappier, for the record.

So just to be clear, as you mentioned, when we undertake a PSA, we are looking down to 10^{-7} type events. We would consider this event a little bit below that, and certainly not a credible one to be looked at.

However, we also do deterministic assessments. And in deterministic assessments, we

don't consider the probability. We just assume the thing has happened.

And in those, we look both at design-based accidents, which nominally get, if you want to put it in probabilistic terms, is probably 10^{-4}, 10^{-5} type events. But we also look at beyond design-based accidents and ensure that there is an understanding of how the reactor would respond.

And with the defence in depth that there is in the design of the plants, we made sure that the releases would be less than what we're talking about here.

THE PRESIDENT: Ms Velshi.

MEMBER VELSHI: Something for you to consider including in your report, and forgive me if it's already there, is the seven-day scenario that you've looked at, which is the lifetime dose, and the associated risks. And it was only in the disposition of comments that I fully appreciated why you had picked seven days and how you can extrapolate the seven days to a lifetime. It could be a factor of two or three, depending on evacuation and so on.

But again, coming back to why we thought the study was -- would be helpful was for people to appreciate what the risk is or the harm,

health or environment, to form an incident like this. And I think a box or something to say, you know, here's why we've done the seven days.

And I don't know if it's modelling restrictions, but maybe it's even partly that. But whatever it is, if you were to look at lifetime, it could be this much and here's what it is, I think, as opposed to people thinking, well, it's fine, seven days, but what about my long-term risks because we're still hearing about the problems from Chernobyl and others for that.

So again, something for your consideration. You may have a comment on it as well.

DR. THOMPSON: Patsy Thompson, for the record.

So we will add -- I don't know if it's an information box, but we'll put something in the report to explain the basis for the seven days and provide, perhaps, some experience in terms of, for example, at Chernobyl when there was an accident, what the long-term doses are, and perhaps then reference the fact sheet that has been posted on our web site addressing the long-term health effects from the Chernobyl accident.

THE PRESIDENT: Thank you.

Dr. McEwan.

Oh, sorry, Monsieur Harvey. I skipped Monsieur Harvey.

MEMBER HARVEY: Merci, monsieur le président.

Mr. McAllister, at the beginning in your presentation, you mentioned that full credit had been given to additional measure post-Fukushima, and it's in the text, too. But at the moment you fix the event, you fix the size of the event, what credit could you give to those measures?

Because, I mean, after that you've got the source for the emission, so what could be done?

I mean, what kind of consideration could be given to those measures?

DR. THOMPSON: Patsy Thompson, for the record.

I'll give sort of a biologist's understanding of this and then perhaps my more reactor behaviour educated people can provide additional information.

My understanding is that with the way we develop the source term is we assume that all the radio nuclides were released in the environment. If we had credited plant safety systems, we could have

credited, for example, the filters that remove a lot of the particulates. So there's things that physically happen within the plant that would have reduced the amount of radio nuclides being released in the environment.

And I'll ask my colleagues to maybe complete my answer.

MR. FRAPPIER: Gerry Frappier, for the record.

So as Dr. Thompson said, if we credit the systems that are in place, you won't have an accident like this. So we had to make the assumptions that you're not going to get your emergency mitigating equipment in place, the operators did not take appropriate actions to even create a scenario where you can get this kind of release.

That's one of the reasons we think the releases is a good one to use because it's severe enough to demonstrate what's going to happen but, at the same time, there is no credible scenario that gets us there because there's other operator actions, systems in place, both the Fukushima emergency mitigation equipment, but also systems that were in place to begin with, the control systems, the cooling functions, the containment functions.

Those are all in place, and they will work as designed and you would not have a release like this.

So we have to remove all of those and then say here's an event that could happen, and that's why we're saying if -- when we're talking about the probabilities of this, if you then add on some of these other things, in particular, the emergency mitigation equipment, it becomes even less of a credible source term.

THE PRESIDENT: Okay. So can I just jump in?

This is, in my opinion, the major deficiency in this study. You do not explain this concept well enough, and so people get into the assumption that you didn't do a severe enough accident.

And I guess I hear continuously the mitigation, the EMEs were not taken into account.

Another way of describing it is, if you take it to account, this would be a 10^{-10} and, therefore, it's not a credible thing so we couldn't use it.

I don't understand why you did not do that. I don't understand in all the studies -- I

mean, there's a couple of places here you reluctantly said, oh, this study is a 10^{-7}. You really shied away -- so let me ask you the question, direct question.

Is 24(4) -- you know, the four time, is that a 10^{-7} study, or not?

I don't understand why you didn't actually rank them by probabilities because you knew that's what everybody's going to criticize you.

So you should have calculated for 10^{14} Becquerel, which, with the mitigation and everything else, this is that kind of a probability, you know. And if you wanted to get to the 10^{-7}, then you use the mitigation to actually be able to allow to study.

I don't think that explains here very well. There's a couple of places -- so for example, in the Table 3.2, when you show the releases between Fukushima and Chernobyl is different, they're different, but they still result at the end because the probabilities are different, if you know what I'm saying here.

So -- because otherwise, you can read that your release is not the same as in Fukushima and with that explanation why, even though it's a smaller release because of the different design, different

probability, the impact -- the dose impact is the same.

So I found this a bit confusing in clarity between the severity, which is normally we use is numerical, and the actual -- you know, in many, many paragraphs here, you keep talking about the mitigation will give us a magnitude of 10, but it hasn't said a magnitude of 10 from what. From 10^{-7} to 10^{-8}.

So I think there's little bits of room for clarity here in this particular subject.

MEMBER HARVEY: That takes my last question.

DR. THOMPSON: If I could, Mr. Binder, just before you finish.

So we'll review the text. I thought that the probability of the source term was explained in terms of it's about 10^{-7}.

The additional information that we provided today in terms of speaker notes in terms of the multi-unit and the probability of 10^{-8} or lower, we'll add to the report to clarify that part of the --

THE PRESIDENT: So repeat what you just said.

So if I understand correctly, the

source term is 10^{-7} without mitigation.

So see, again, it would be at the source term with mitigation, it'll be 10^{-8}, 10^{-9}, whatever it will be.

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

So yes, I would agree with what you were just saying there, that the source term with mitigation we would view as something that's going to be low down into the 10^{-8} type range.

We can look at beefing up the clarity of that.

MEMBER HARVEY: That brings me to my last question.

Number 149 in the -- in your response to the documents, it's about the -- no, it's not. I'm sorry. Sorry, no.

Okay, in 119. It's page 108. It's from Ministry of Health and fire marshal. The tone of the report repeatedly overstates the safety of CANDU and you -- the answer is as a regulatory body, it would be irresponsible to sign off on the safety of the reactors.

But the study itself has not much to do with CANDU. I mean, nothing to do with CANDU.

And you've got the source, and you make the study, but the CANDU itself and the -- to support that is just the -- what has been mentioned by the President because it's no more the -- that's a new CANDU with the -- all the mitigation measures, the new equipment that has been had.

So I don't know why the tone should be -- and we should mention the safety of the CANDU, but it's nothing to do with that.

DR. THOMPSON: Patsy Thompson, for the record.

So the -- actually, the source term that was used for the study is actually very linked to the Darlington CANDU units, so the generic --

MEMBER HARVEY: That part right at the beginning.

DR. THOMPSON: So the source term is linked to CANDU.

What we tried to do is to explain -- we -- on Chapter 2 of the report where we explained defence in depth and other safety systems, and it's to put the accent in context because we do say it's a hypothetical severe accident.

And so it's hypothetical because of the defence in depth and other safety systems, so we

thought it was important to explain them.

MEMBER HARVEY: It'd be better to explain it like you do now than to sit at a CANDU site. I mean, the CANDU report produced such and such a thing, then we start our study.

DR. THOMPSON: So my -- we'll adjust the wording in the response.

MEMBER HARVEY: Okay. That's it.

THE PRESIDENT: Okay. Dr. McEwan?

MEMBER McEWAN: Thank you, Mr. President.

Sort of very, very specific and a couple of general comments and questions.

In Table 5.1 on page 40, you mention the incidence rates linked to cancers in some regional centres, Canadian national, and Ontario. If you look at the third cancer incidence, it is, I'm guessing, meaningfully higher, particularly in the 50 to 64 age group and in the 20 to 49 group than the rest of the country.

I think it might be helpful to actually show regional rates across the country and regional rates across Ontario.

If I remember the national data, thyroid cancer instances is highest in southern

Ontario and southern Alberta, and there are quite big regional differences across Ontario and quite big regional differences across the country.

And I think it would be useful to give that just to understand the idea of baseline cancer rates and understand the baseline against which you're measuring.

DR. THOMPSON: Okay. So Patsy Thompson, for the record.

So we'll add information we'll link to Table 5.1. We have that information already in the Radecon study, so it's quite easy to add text to put that context in place.

THE PRESIDENT: But I think the point is the variability -- the natural variability independent of nuclear would be kind of important to see. That's why you can use -- you cannot detect the increases beyond background. That's what affects viability.

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

So what I was talking about, if you'll recall in the Radecon, we have cancer rates by district or counties or whatever they're called in Ontario and where we do see the -- quite variability

across Ontario and different regions. And so that's -- we can put that information there to provide that context.

MEMBER McEWAN: So there's also a very nice map on the Health Canada web site that shows variation across the country, not only for thyroid cancer, but for other cancers.

But I think -- so my second question comes back to a comment I made at the beginning, and which you reference, and that is the translation of some of the data into a format that is understandable by the general public.

And I am not sure you have achieved that in the extended executive summary. And I think that is indicated. There were certainly a couple of comments from the interveners that were suggesting that you were suggesting that a 30 per cent increase in cancer risk was not significant.

And I think that really is -- again, it goes back to an understanding of the baseline, the overall incidents, and the numbers increasing. And I think it is really important as you go through all of the charts that you have at the back describing increased cancer incidence and increased cancer rate.

I think we really do need to try and

put that into a digestible format for the general public so that they understand that an increase of 30 per cent in a very rare cancer is a very very small incidence.

DR. THOMPSON: Patsy Thompson, for the record.

In the report itself we thought we had addressed -- you had a similar request last June where we did provide the variability across Ontario to put the findings in context.

But perhaps we would better serve the public if we collected that information, put it in the table, so it is all in the same place rather than disbursed in different sections.

MEMBER McEWAN: Yes. I think that is the problem with it, is you that have to go to about eight different sections to find all of those pieces of data. And I think that for people to really understand what the risk is...

So the final question that I have is, the information sheet that you published on the Chernobyl data was actually, I thought, very helpful, but a little brief. And a little explanation under some of just what were effectively bullet points might have been helpful.

Particularly, a discussion around the difference in incidence increase in thyroid cancer in children and adults. The fact that you had I think three or four lines in it. I think a little more description around that might have been helpful just to understand.

And I think it's also important to recognize that, you know, thyroid cancer in children, that table that I referenced, is rare.

THE PRESIDENT: And of course, the one thing that everybody sort of applauds in Fukushima is the quick evacuation and quick administration of KI pills lead now to the conclusion that it is not likely to have a significant kind of thyroid -- and that again can be amplified because of the (indiscerible) scare and latest data is some interesting observation on that.

Member Tolgyesi?

MEMBER TOLGYESI: Merci, Monsieur le Président.

This is a question to Mr. Kontra, the Fire Marshall. When you are looking at Annex 2, the distances and the modelling structure for wind and population-based considerations. Considering the wind rose --

THE PRESIDENT: What page is this?

MEMBER TOLGYESI: That is page 85.

THE PRESIDENT: Eight-five.

MEMBER TOLGYESI: Considering the wind rose, predominant winds are west, north-west, so they are blowing across the lake eventually towards the U.S., although if it is a 60-kilometre distance. What communications do you have with your U.S. counterparts because in case of this type of accident?

Because I think there will be kind of worries what has happened. Because when we were talking about Fukushima the question was that wind is blowing across from Japan to the continent and towards even the west.

So what do you do to make sure that there is no -- what type of communications do you have?

MR. KONTRA: Tom Kontra, for the record.

Thank you for that question. In fact, we do have multiple layers of communication. The province directly has communications in that case with the State of New York authorities. But of course by informing CNSC and Health Canada, we also have the federal cross-over to U.S. Federal authorities in this

regard.

So there is a multiple banking of information sharing with the U.S. at appropriate levels. So in our plan there are some default points where we would automatically notify the U.S. authorities in New York State.

MEMBER TOLGYESI: Okay. This is a question about technical probably to OPG.

In one of these comments, which was number 106, came from New Clear Free Solutions and page 103. There was a comment on replacing pressure tubes in Darlington, but not replacing the steam generators.

What are the potential consequences of interaction between the new pressure tubes and the aged steam generators? Is there some reason to worry or not?

MS SWAMI: Laurie Swami, for the record.

The interaction would not be the result of or cause an accident. In fact, when we were doing the scoping for the Darlington Refurbishment Project, we looked at the condition of the steam generators and confirmed that they were in very good shape.

And part of the process going forward of course is to continue to do inspections on a routine basis to confirm that they continue to be fit for duty, and that is part of our ongoing maintenance program within the plant, and that will continue regardless of replacement of the pressure tubes.

MEMBER TOLGYESI: And my last comment. I am going to go back to talking about overview of Canadian nuclear power plants, and on page 15 we are saying why an accident like Fukushima is unlikely to happen in Canada, why Chernobyl cannot happen in Canada.

And there are some detailed provisions to prevent fuel and fuel channel failures. Could we add one or two pictures about calandria? Because when you look on page 7 you have barriers to release of radio activity in CANDU.

But could you add some pictures of calandria and to make comprehensive to the general public? Because I think, you know, we have core details and the barriers to release radio activity in CANDU on page 7, which is fuel rods, pressure tubes, et cetera.

But after we are talking about calandria, which is one of many components, and there

is nothing on the picture that the general public can understand. Because it is not only those who are quite involved in the nuclear industry who will read this report.

DR. THOMPSON: Mr. Tolgyesi, just so I understand, you are looking at page 7, figure 2.1?

MEMBER TOLGYESI: Yes. There are some -- there is a picture, yes.

DR. THOMPSON: The grey part at the bottom where is the calandria?

MEMBER TOLGYESI: Yes. And calandria is there but, you know, what is that? It is like calandria, but you are talking after about containing radiation and additional layers of protection and cooling the fuel.

Is there something that we could be more precise probably about calandria also as a figure?

THE PRESIDENT: I think we have on our web all kinds of simulations of an accident. But I think what would be useful in here, and we haven't seen it, we keep talking about this inventory of water. I think we can actually put in the volume of water and compare it to Fukushima nuclear power plant or any other design.

It is actually a significant -- a lot more water. And we have never done it in terms of comparison. It may be useful kind of data to indicate the magnitude of water being retained in the calandria versus some of the other designs.

Go ahead.

MR. RINFRET: Francois Rinfret, for the record, Director for the Darlington Regulatory Program.

I just wanted to offer you that on page 15, there is a beginning of an explanation of the amount of water in the Canadian reactors to be significantly different and higher than the amount of water available for cooling instead of --

THE PRESIDENT: That is what I meant, to put in there a little comparison.

MR. RINFRET: Yes, okay. And also adding probabilities of these other layers of protection that would have to be broken in order to lead to this source terminal being available out there in the environment.

THE PRESIDENT: Okay.

MR. RINFRET: Thank you.

THE PRESIDENT: Mr. Tolgyesi?

C'est tout?

Ms Velshi?

MEMBER VELSHI: C'est tout.

THE PRESIDENT: M. Harvey?

Anybody else want to say a final word here?

I think have people from New Brunswick also on the line. Are they? New Brunswick, are you on the line?

I guess not.

So anybody else want to say...? Dr. Thompson?

MR. MacCALLUM: Yes, we are on the line here in New Brunswick.

THE PRESIDENT: Okay. You know, I am going around. Anything you want to add to this conversation?

MR. MacCALLUM: It is Greg MacCallum, for the record.

At this point, we don't have a lot to add. Our circumstances of course are quite different here in New Brunswick. We find from the discussion of this report, as it has been presented, that in terms of compliance with the requirements for emergency mitigation and for the emergency plan germane to Point Lepreau, that we are comfortable in that we meet all

the requirements thereof.

I know we are going to be discussing potassium iodide distribution later, but again I think you are aware that here in New Brunswick, you know, in collaboration with the operators, that we have pre-distributed to all potentially affected personnel in the zones around the plant.

It is an informative discussion and, as I said, it is encouraging to hear that from everything we have heard we are compliant with the requirements.

Thank you for the chance to comment, sir.

THE PRESIDENT: Thank you.

Dr. Thompson?

DR. THOMPSON: Patsy Thompson, for the record.

If you will give us a few seconds, we would like to correct the record. When we responded to Dr. McEwan's question on dose and dose rate effectiveness factor, we didn't quite get it right, and so I would like to make sure that the transcript is correct.

MS RICKARD: Thank you, Dr. Thompson. It is Melanie Rickard again for the record.

Yes. So, Dr. McEwan, your question was with regards to the table on page 108. So I believe I said that the dose rate -- the DDREF was not used in RadRAT. It is in fact accounted for in RadRAT, which is the correct approach.

There are some uncertainties that are linked to the use of that in the context of the study, which are accounted for in the 90% confidence results. The confusion was surrounding the first column with regards to the assumption in the table. It is definitely not clear, so we are going to re-evaluate the text in the table and get that right.

Thanks.

THE PRESIDENT: Anything else?

OPG?

MS SWAMI: Laurie Swami, for the record.

I have no further comments, except to say we look forward to seeing this report on the public record, we think that will be very helpful going forward.

THE PRESIDENT: Okay. Thank you. Thank you very much.

Okay, we will break for 10 minutes, reconvene around 11:00.

Thank you.

--- Upon recessing at 10:51 a.m. /
Suspension à 10 h 51
--- Upon resuming at 11:04 a.m. /
Reprise à 11 h 04

CMD 15-M13/15-M13.A

Oral presentation by CNSC staff

THE PRESIDENT: So the next item on the agenda is an update from CNSC staff on the distribution of potassium iodide KI tablets, as outlined in CMD 15-M13 and 15-M13.A.

We also have a representative from the Office of the Fire Marshall. Mr. Kontra is still with us. Can you hear us, Mr. Kontra?

MR. KONTRA: Yes, our team is still here.

THE PRESIDENT: Thank you. And we have Mr. MacCallum from New Brunswick.

Mr. MacCallum, can you hear us?

MR. MacCALLUM: Yes, sir, we are back on the line.

THE PRESIDENT: Okay. So, Mr.

Frappier, I understand you are going to make the presentation? Please proceed.

M. FRAPPIER : Merci, Monsieur le Président et les membres de la Commission.

My name is Gerry Frappier and I am the Director General of the Directorate of Analysis and Assessment here at the CNSC.

With me today is Monsieur Luc Sigouin, Director of Emergency Management Programs Division; Mr. Bernie Beaudin, Emergency Management Program Officer within that division.

And Mr. Sigouin will be making the presentation this morning.

With us, as you just mentioned via teleconference, are representatives from the New Brunswick Emergency Measures Organization, as well as Ontario's Office of the Fire Marshall and Emergency Management.

We are here to provide the Commission with an update on the distribution of potassium iodide tablets, as directed by the Commission in August of 2014.

I will now turn the presentation over to Mr. Sigouin.

M. SIGOUIN : Merci, Monsieur Frappier.

Bonjour, Monsieur le Président, Madame, Messieurs les Commissaires. Mon nom est Luc Sigouin. Je suis directeur de la Division des programmes de gestion d'urgence à la CCSN.

Today, we will provide an update on KI distribution and give an overview of the approaches being used in Ontario and New Brunswick.

Bit of background, this update on KI distribution initiative is a result of the CNSC REGDOC-2.10.1 and a decision made by the Commission in August 2014 to have KI pre-distributed in the primary zone and stockpiled or pre-stocked in the secondary zone for all nuclear power plants and the CNL reactor.

This requirement was included in the licence conditions handbook for these facilities with a completion date of December, 2015.

The requirement was for KI to be pre-distributed to all residences, businesses, and institutions within the primary or plume exposure planning zones. The primary zone is normally between 8 and 12 km from major nuclear facilities in Canada.

For example, the CNL primary zone is 9 km, the Ontario Nuclear Power Plant primary zones are 10 km, and the New Brunswick zones for Point Lepreau is 12 km.

In addition, there is a requirement for KI to be purchased and pre-stocked in strategic locations for persons in the secondary or ingestion planning zone.

It should be noted that potassium iodide tablets have a life expectancy of approximately five to seven years, depending on the form and manufacturer. Therefore, the provinces will have to redistribute KI pills approximately every five years.

If we look specifically at New Brunswick, in New Brunswick KI pills have been distributed to each residence in the 12 km planning zone as well as within the 20 km planning zone of the Point Lepreau nuclear power plant since 1982.

Every household receives a bottle containing 28 KI pills. The distribution is done in a door to door manner by local emergency wardens and includes an information pamphlet on how to use the KI.

The Province of New Brunswick also has stockpiles outside of the 20 km planning zone and has three stockpile locations beyond the 50 km zone.

The last distribution campaign took place in 2011, and work is already underway preparing for the refresher distribution in early 2016.

New Brunswick Emergency Measures

Organization will now include a new health brochure called *Radiation Exposure from Nuclear Plant Incidents* in their campaign of 2016.

In regards to Ontario, it should be noted that KI has always been a part of the Ontario Nuclear Emergency Plans. Currently, there are sufficient quantities of KI already in stock for residents of the 10 km primary zone, and some of it is pre-distributed to institutions such as schools and healthcare facilities.

This current initiative that we are providing an update for addresses expanding the pre-distribution activities to all residences, businesses and institutions, as well as addressing KI requirements beyond the primary zone.

The Office of the Fire Marshall and Emergency Management has established a cross-functional working group to coordinate and manage this initiative.

In addition to the main working group, there are two sub or task groups in place, each focusing respectively on the distribution aspects and also on the public education aspects.

More than 10 organizations are involved in the working group, including provincial

ministries, regional and municipal levels, and all licensees affected by this. There is good participation and a high level of engagement from all the representatives in these working groups.

If we look now at the Ontario strategy, the working group has developed a strategy for pre-distribution and pre-stocking for the Ontario sites.

For the primary zones, which appear in shaded blue in these maps, sufficient KI will be distributed for each person for two days' duration.

For the secondary zone where KI is to be pre-stocked, these are the largest circles on the maps. The working group has decided to purchase and pre-stock KI pills for the sensitive population, which consist of pregnant or breastfeeding women as well as people under the age of 19.

The status in Ontario is as follows. Bruce Power has already started the process of procurement of approximately 64,000 KI pills. They plan on initiating pre-distribution in April with a target completion date over the course of the summer.

For OPG, you can see that the number of pills required is higher due to the population base in Durham Region and the eastern part of the City of

Toronto.

OPG is in the process or procuring KI pills with distribution planned for October and a target completion date of November 2015.

Canadian Nuclear Labs is also in the process of moving ahead on procurement of approximately 63,000 KI pills and pre-distribution is planned for the summer with a target completion date in the fall of 2015.

In conclusion, Mr. President, New Brunswick already meets the requirements of the Commission decision. As for Ontario, key stakeholders are working together to implement an affective solution for pre-distribution and pre-stocking in each of the communities, and they are on target to meet the December 2015 deadline.

This concludes Staff's presentation, and we are prepared to answer your questions.

Thank you.

THE PRESIDENT: Thank you.

Before getting to the question session, I understand that Mr. Kontra would like to make a presentation.

Mr. Kontra, the floor is yours.

MR. SULEMAN: Good morning, Dr. Binder.

This is Al Suleman, Director of Prevention and Risk Management with the Office of the Fire Marshal and Emergency Management, for the record.

I will just be making a brief statement and then will turn over the presentation to my colleague Dave Nodwell.

So first let me say that I am very pleased to be attending my first Commission meeting in my capacity as Director responsible for the nuclear file in Ontario, hence, the integration of the Office of the Fire Marshal and Emergency Management Ontario.

As I mentioned, I am joined by my Program Manager, Dave Nodwell, and of course you've already met Deputy Chief Tom Kontra on the phone. And you're well acquainted with both Dave Nodwell and Deputy Chief Tom Kontra and they are my subject matter experts on all things nuclear.

I would like to thank the Commission for this opportunity to update you on the progress being made with respect to the distribution of KI pills in Ontario's nuclear jurisdiction.

Much of what you hear today was already communicated to Dr. Binder in the letter from Fire Marshal and Chief Ted Wieclawek in his letter of March 9th, 2015, and some of what we will cover in our presentation was also

covered in Mr. Sigouin's presentation.

As you will appreciate, KI distribution is a multijurisdictional effort and I would like to commend the tremendous effort, resources and commitment of our nuclear facilities, nuclear municipalities, specifically Durham Region, Toronto, Kincardine and Deep River/Laurentian Hills, as well as Ontario's Ministry of Health and Long-Term Care to this important initiative.

Of course we all know that mass distribution of KI is not simply a matter of putting pills in an envelope and mailing them. There are numerous considerations and issues to manage, from product integrity to ensuring that recipients don't just discard the pills unwanted in the trash, which is why we've put significant efforts towards public education.

Effectiveness and sustainability are key to the success of the program. As you will see in our presentation, the OFMEM and partners are committed to building a KI distribution program that is effective and sustainable and that meets the requirements of REGDOC-2.10.1.

I will now pass off to Dave Nodwell to walk us through the presentation. Thank you.

MR. NODWELL: Thank you very much.

Dave Nodwell, Office of the Fire Marshal

and Emergency Management, for the record.

If I could have the next slide, please.

I will be discussing over the next couple of minutes providing some provincial context to the subject of KI. I'll talk about the KI Distribution Working Group, who it's comprised of and how it's structured, take a look at accomplishments to date, some of the issues and concerns, and then finally conclusion with an opportunity for questions.

If I could have the next slide, please.

So, as you're aware, KI is governed by the Provincial Nuclear Emergency Response Plan in terms of how it's applied in a nuclear emergency. It details the offsite nuclear emergency management responsibilities which fall under the *Emergency Management and Civil Protection Act*, including those for potassium iodide.

It discusses the implementation -- or that the KI pill distribution is ultimately a municipal responsibility and that providing resources to facilitate that distribution is the responsibility of the respective nuclear facilities. In an emergency, administering KI pills is at the direction of the Provincial Chief Medical Officer of Health under the Radiation Health Response Plan.

If I could have the next slide, please.

Within the context of the PNERP, KI is one

of many potential protective measures that would be utilized. The strategy employed in the PNERP is that evacuation would be the preferred protective measure that would be implemented. Iodine Thyroid Blocking would be undertaken only in conjunction with either evacuation or sheltering. And of course, as has been discussed many times, the pre-distribution of KI pills is most critical in an immediate emission scenario.

Next slide, please.

The Radiation Health Response Plan provides guidelines for KI and they include such information as procurement, stocking and distribution. Specifically, the Plan deals with things such as what information should be provided with the tablets; advice on distribution strategies, public education and recommended locations of KI stocks. And it talks about the functions during the planning and response phases related to KI.

The document also addresses, through the KI Guidelines, risks and other concerns associated with KI, for example, newborns and pregnant women, who need to be dealt with somewhat differently, the risk of hypothyroidism for the newborn, and the use of KI for persons over the age of 40. Clinical conditions that contraindicate the administration of KI are also included.

The next slide, please.

The provincial KI Distribution Working Group was first assembled in June of 2013 and it was designed to enhance the existing distribution methods that were already implemented and included distribution to institutions, schools and so forth, and in the case of Durham Region in particular, to the public through pharmacies on a voluntary basis. So the intent was to enhance this strategy and build it into something more effective.

This Working Group continues its work with the further mandate to align the KI strategy with the newly published CNSC REGDOC-2.10.1.

The Working Group is focussing its efforts on a provincial distribution strategy, recognizing that the actual distribution methods are the responsibility of local municipalities and subject to local variation given the different needs that exist between nuclear jurisdictions.

Next slide, please.

This slide provides an overview of the Working Group that we have established.

It's chaired by the Office of the Fire Marshal and Emergency Management, includes municipal representatives from Durham, the City of Toronto, Kincardine, Deep River and Laurentian Hills, and the Town of Amherstburg.

We have as well representatives from the Canadian Nuclear Safety Commission who participate in these meetings, the facilities themselves, Ontario Power Generation, Bruce Power and AECL, and we're provided with support from the Ministry of Health and Long-Term Care Emergency Management Branch.

If I could have the next slide, please.

So we have two sub-groups that work under this Working Group. One is dealing specifically with distribution, the other, public education.

So in terms of the Distribution Working Group, some of the key accomplishments to date include the definition of Primary Zone and Secondary Zone distribution principles in order to meet the requirement under REGDOC-2.10.1. We have defined the required number of pills for each nuclear area's Primary and Secondary Zone to facilitate the procurement process, which in some cases is a substantial number of pills.

Currently, discussions are under way detailing the specifics of the Primary Zone and Secondary Zone distribution mechanisms and these include dealing with organizations such as the Ontario Pharmacy Association, the Ontario Government Pharmacy, and looking at a number of mass distribution options that would include potentially mail, coupons or door-to-door distribution.

I'll point out specifically with respect to the Secondary Zone that the target population within that zone is in fact children under the age of 18, pregnant women and breastfeeding women. However, I point out as well that a part of that includes making sure that it's available to any member of the population in the Secondary Zone that would desire to have KI in their possession.

Next slide, please.

With respect to public education, there has been a commitment made on the part of the Office of the Fire Marshal and Emergency Management to develop a comprehensive and centralized NUCLEAR website which will include detailed information on KI, but of course it will be much broader in scope than just the KI.

There is ongoing work in the creation of a toolbox of communication products to support KI pill distribution efforts in all nuclear areas. So this would provide a provincial level of consistency in terms of the look and feel of the documents that are being used and would include such things as fact sheets, FAQs and a variety of social media products.

Part of the effort as well has been to develop consistent wording for KI pill packaging across nuclear jurisdictions. So what we will see distributed in the Bruce area will be very similar to what would be seen

in the areas of Chalk River and Durham Region.

To help inform and support this work, there have been a number of focus groups and surveys that have been held in Bowmanville and Ajax and other work to determine public perceptions and public needs related to both the KI pills and KI education.

A draft communication strategy is being developed as well that would look at things such as radio and newspaper advertising, targeted online advertising in social media and so forth. So this would be a lot of this occurring prior to the distribution of actual KI pills so that people know what it is that they're receiving and why.

If I could have then the next slide, please.

I would like to make you aware of some of the issues that we are facing and some of the challenges that we have on our path towards the implementation of KI pre-distribution.

While there has been no information to date that discolouration causes instability in the pills, we have yet to confirm that it does not. This has arisen from some existing pills that have a very discoloured look to them and we're very concerned that that does not reflect instability in the actual pills or reduce efficacy. So we're in the process of determining that.

There have been issues raised by pharmacies that we're currently dealing with, how they will be indemnified, for example, should there be a problem with the pills and how the compensation element would work for the distribution and consultation that would be associated with that.

Part and parcel with the provincial position is that the credibility of the source of distribution needs to be verifiable and consequently there have been many discussions and concerns related to some of the mass distribution options.

It would appear, to meet the timeline, that mass distribution would be required specifically in the Durham and Toronto areas and we need to ensure that as far as possible misuse and tampering is not a threat and that members of the public would not disregard or discard the pills due to mistrust resulting from receiving them in the mail.

Despite serious reservations about this, as noted, there would be a strong public education campaign preceding the distribution of these pills, and partners are and have committed to the development of a longer-term effective and sustainable strategy that would involve the use of a credible source.

So these issues have been resolved and are

currently being worked on at the Working Group level.

If I could have the next slide, please.

In conclusion, the Province and its many partners continue to work diligently to develop and implement materials and strategies to facilitate local KI pill distribution. This work is being undertaken in accordance with the provincial position on KI distribution and this has been confirmed in correspondence to the CNSC and specifically is suggesting that KI distribution to the public be accomplished using pharmacists, medical doctors or other credible sources, however, also consistent with the requirements of REGDOC-2.10.1.

And in conclusion, as mentioned, we are working diligently to meet the requirements of 2.10.1 and we will continue to update the Commission throughout the year so that you're apprised of the progress that is being made.

That concludes our presentation. I welcome the opportunity for questions.

THE PRESIDENT: Thank you. Thank you very much.

I would like to open the floor now for questions, but before I do this, just to inform colleagues that we have representatives from Health Canada here today. We have Ms Quayle, Chief, Radiation Health Assessment

Division, and Ms Bergman, I understand. So don't be shy about asking them relevant questions.

So let's start with Monsieur Tolgyesi.

MEMBER TOLGYESI: This is to the Fire Marshal Office.

Did I understand well that you were saying that there could be a distribution by May of these pills?

MR. KONTRA: Tom Kontra for the record.

It is certainly one of the options that was first proposed by Dr. Binder and it's certainly still in consideration along with the various others.

MEMBER TOLGYESI: You were talking about issues and concerns. In general issues you were talking about pharmacies' indemnification and compensation. Now, considering that this program is supposed to be fully operational by the end of 2015, do you think that these negotiations for compensation for pharmacies will be completed at that time or should there be some temporary measures?

MR. KONTRA: Tom Kontra for the record.

The discussion as presented by Mr. Nodwell is the current state of procedures. We are at all times maintaining focus on the December 31st deadline and depending on how the discussions proceed, the combination of the discussion results and the looming deadline will

probably determine the option that we decide on. We have at this moment not determined a final option.

MEMBER TOLGYESI: And what is the role of the Ontario Ministry of Health with these discussions and negotiations with the pharmacies? Are they involved? Because if there is compensation, somebody will have to pay. So who will do that?

MR. KONTRA: The discussions on the use of KI have to come under the Health Authority. As we've outlined for our Plan, they're also the direct liaison with organizations like the pharmacists. So as opposed to an Emergency Manager like myself trying to talk to specialists, we have the specialists who deal on a day-to-day basis with them doing that discussion.

THE PRESIDENT: Monsieur Harvey.

MEMBRE HARVEY : Merci, Monsieur le Président.

First, I want to express my appreciation for the work done and the file is on the rails and will be at the station in December, which is fantastic.

I have two questions. The first one is it's an ongoing file because once the distribution is completed, there is in those populations in the Primary Zone a certain number of movement of population during those five years. Do you have any provision to take care

of that point, that people are coming in and coming out? What strategy is in the REGDOC and also for the other entities?

MR. KONTRA: Tom Kontra for the record.

I can't speak for the REGDOC but in our discussions we have definitely taken cognizance of the fact that there is population movement. In addition, there is continuing population growth in those areas and that will form a part of our solution as we continue with our current setup where new population coming into the area will be receiving the public education aspects and will be directed to where they can get the KI supplies.

MEMBER HARVEY: Okay.

Mr. Sigouin.

M. SIGOUIN : Merci.

Luc Sigouin for the record.

Maybe we could ask our colleagues from New Brunswick to give us some insight of how they're managing that as well but I think the points raised by Mr. Kontra are key, that this will require an ongoing effort to manage the arrival of new residents or construction of new businesses or new institutions in the Primary Zone so that an ongoing public education campaign will be key and is expected to be required for this.

So I wonder if Mr. MacCallum can add

something.

MR. MacCALLUM: Yes. Greg MacCallum for the record, again.

In the case of the Emergency Planning Zone around Point Lepreau Generating Station, we have a fairly stable population, so we don't have a whole lot of movement in or out.

However, in anticipation of that and other factors, we have a warden service and we've segmented the Emergency Planning Zone and assigned sectors thereof to the wardens, individual wardens who maintain situational awareness about who is in their zones, what their vulnerabilities are and if there's movement or change in households, and they maintain a ready supply, a reserve if you like, of KI for immediate distribution if someone new moves in or someone departs.

That is but one layer of the public information and public education aspect of this and periodically these folks will -- wardens, that is, will ensure that they report any changes and report on the fact that they have refreshed or issued KI to any movement within their respective regions.

We maintain a detailed demographic database of who lives and works and even recreates in the emergency planning zone and those folks are all accounted

for in the distribution plan. And an order of magnitude is significantly simpler in our case because of the total population that is permanently residing there, but we also account for transient populations, in particular in the summertime, using local parks, beaches or any businesses that may be found there. I hope that clarifies.

Thank you.

MEMBER HARVEY: Okay. My last question is in line with that.

This is the -- as the shelf life of those pills is five years, who has the responsibility after five years to initiate the renewal of that and how will you manage that the old pills will be thrown away, or how will you manage that and what is in the regulations about that?

MR. MacCALLUM: If that question is directed to New Brunswick, I would happily address it. We do keep a record of distribution and as well we do a one-for-one exchange upon refreshing the holdings in each household, business or facility within the emergency planning zone. So the expiring pills are withdrawn and replaced with a fresh set on a rotating basis. This distribution is done through our Warden Service on a door-to-door basis.

MEMBER HARVEY: I suppose that's the same thing for Ontario and elsewhere, is it?

MR. KONTRA: Tom Kontra, for the record.

For Ontario, our current system already has a basis for refreshing, so we keep track of when they were issued and bring forward the appropriate date for reordering, and so on. The discussions that I have been party to with our working group have already considered this so that it will be a part of the total program and part of the public education.

So depending on the actual pills that are received, we will know whether they are five or seven years and we will make appropriate arrangements with the operators, with the facilities to purchase at the appropriate time and to revisit the distribution...

--- Technical difficulties / Problèmes techniques

MEMBER HARVEY: We lost him, I know.

Okay. Thank you.

THE PRESIDENT: Dr. McEwan...?

MEMBER McEWAN: Thank you, Mr. President.

I'm a little concerned that you have created -- I guess this is for Ontario -- what seems to me an enormously complicated process to move this forward. Have you benchmarked with, for example, France to see how they distributed over a large population and how they facilitated it?

--- Pause

THE PRESIDENT: Are you still on the line? Somebody pushed a button somewhere and they disconnected? Is New Brunswick online? No?

--- Pause

THE PRESIDENT: See if you can reconnect.

It seems to me that before we did the REGDOC there was all kinds of benchmarking studies, were there not? Do you want to talk to it a bit?

MR. SIGOUIN: Luc Sigouin, Director of Emergency Management Programs.

Having participated in some of the discussions of the working group I know that the working group has considered other jurisdictions and how they have done it. In particular they have had some discussions with representatives from the Province of Québec to understand how Québec has done it.

I believe OFMEM has looked into the approach that was used in France. I don't know that a formal benchmarking was used, but what was used in France was a coupon system that Ontario is considering and then follow-up with either direct mail or door-to-door.

THE PRESIDENT: It's a good time to ask Health Canada's interest in all of this and, you know, I noticed -- did I miss it? You are not a party to this working group. Are you interested?

MS QUAYLE: Debra Quayle, for the record.

We are always interested, but I would say that the distribution and implementation of the protective action guidelines with respect to thyroid blocking agents is beyond the scope of Health Canada's mandate, so that would be why we are not more actively involved in this.

THE PRESIDENT: Actually I'm surprised because don't you set the -- and I am digressing a little bit -- into the recovery study? So for example, on the sheltering and when people can come back, I thought that was in Health Canada's mandate. In fact, I think it is the parameters that are established by Health Canada.

--- Pause

MS QUAYLE: So again -- Debra Quayle, for the record -- I would reiterate that while it is within our mandate to establish recommendations and guidelines for actions during an emergency, as well as after an emergency, the actual manner in which those are implemented is the responsibility of the province, which is the organization leading the response, as well as leading the recovery actions. So we do have a 50 mSv -- well, we have 100 mSv threshold dose right now, the new intervention guidelines will have a 50 mSv dose

THE PRESIDENT: But I am looking at -- I am interested now -- while we are waiting for them to

connect it's an opportunity to grill you a little bit.

And that is post-Fukushima it's an international preoccupation now about -- as you know, there was a lot of debate about when people in Fukushima can go back home and the world is now taking around this 20 mSv. I wonder whether you have a timeline as to when Health Canada will review and come up with the new guidelines.

In the meantime, did we get the Office of the Fire Marshal back online?

MR. KONTRA: Yes, we are here.

THE PRESIDENT: And New Brunswick?

MR. MacCALLUM: Yes, sir, we are here.

THE PRESIDENT: Okay. I don't know what happened, so sorry for that.

MS QUAYLE: Debra Quayle, for the record.

I agree with you the recovery is a very -- it's a field that we should be spending some time on. We are currently in the process of finalizing our new intervention guidelines, protective action guidelines for emergency response, and recovery is on the list or coming up next but we have not yet begun work in that area.

THE PRESIDENT: Thank you.

Back to where -- Mr. McEwan, you had a question for the Fire Marshal Office?

MEMBER McEWAN: Maybe, Mr. President, I

could just finish a Health Canada question to complete that loop.

THE PRESIDENT: By all means.

MEMBER McEWAN: So I'm interested that you have no interest in product stability. Would you not be intimately interested in the stability and shelf life of the product?

--- Pause

MS QUAYLE: Okay. Debra Quayle for the record.

Just to say that KI is -- I believe it's a natural food product. It's not a drug. And in either case it is the responsibility of a different branch of Health Canada than where we are.

So I misspoke when I said Health -- I should not have created the impression that Health Canada is not interested in the stability of KI. The Radiation Protection Bureau at this point is relying on our colleagues elsewhere in Health Canada to advise us on any issues related to that.

THE PRESIDENT: Pass on the message. We are going to drag you into this whether you like it or not. Go ahead.

MR. SIGOUIN: Luc Sigouin for the record.

If I could just add a clarification for

that? And Mr. Kontra can address this as well, but the Ontario Ministry of Health has been in contact with the Health Canada branch that is responsible for KI natural products and they have engaged in discussions about packaging and discolouration. So those discussions are oak erring.

THE PRESIDENT: Thank you. Dr. McEwan...?

MEMBER McEWAN: Thank you.

Mr. Kontra, I'm sorry that we lost you.

I am concerned. I think it's highly unlikely that you are going to meet the December deadline on the complexity of the process that you have described. Have you used, for example, the French example as a template or a benchmark to enable you to speed up the process and actually start from higher than baseline for the Ontario process?

MR. KONTRA: Tom Kontra, for the record.

The team that is discussing the options is mindful of the deadline and is mindful of having to make appropriate steps in order to deliver. The first step in this process was determined to be the necessary or, rather, the acquisition of the necessary number of pills which is in process now. The expectation for the delivery of those pills is in the timeframe of August and we do have that little bit of time to refine the option that we are going

to choose.

MEMBER McEWAN: Thank you.

So if I go to your slide 5, now my understanding is that where there has been a mass distribution of potassium iodide in an emergency, the incidence of side effects has been, if not zero it has been negligible and I think I saw a figure of two reported cases of an allergic reaction, presumably to the iodine.

So could you explain to me what clinical conditions would contraindicate the administration and how you are going to explain that to a frightened population?

And secondly, what are the contraindications to the use of potassium iodide for people over 40, because I would certainly be reluctant myself not to take it?

MR. KONTRA: Tom Kontra, for the record.

First of all, we must recognize that I am not a medical expert and so I am not qualified to specifically answer your question. Our Ministry of Health and Long-Term Care unfortunately could not attend today. That is a question that I am prepared to take away to them and have sent back to the Commission in short order.

Essentially the second part, I happen to be somewhat over 40 myself and my understanding is the older you are, the less time you have to develop

consequences from exposure. That is my understanding of the possible different considerations for those over 40 but, as I say, I am happy to take your question to the medical experts and have them answer it, unless Health Canada is prepared to do so on the call now.

MS QUAYLE: Debra Quayle, for the record.

No, Health Canada is not prepared to do so. I should add for the record that we were not expecting to be answering questions on potassium iodide at this hearing. So I will take the opportunity to take this information back and follow up, but I cannot provide an answer at this time.

MEMBER McEWAN: So there is a discrepancy, or a discordance is perhaps a better word, between the CNSC and the Ontario slide decks. On slide 6 there is a stockpile for the second early zone, a stockpile for a sensitive population only. I think I heard you say, Mr. Kontra, that in fact there would be availability outside of just that sensitive population.

But when I look at this I see that the stockpile is for pregnant women, and yet in your slide 5 you imply that there may be a contraindication to the administration of potassium iodide in pregnant women. That to me, if I was a member of the public, would be a confusing juxtaposition.

MR. KONTRA: First of all, you are quite correct. We have indicated in our discussion with the slide that we would -- we have in fact calculated in the number of pills an additional percentage that would be available for people that wish to have the pills at hand in the secondary zone.

The aspect of what we are considering as contrary indicators and so on are points for discussion and they are in this presentation to keep you apprised. The public education that goes out with the stock of pills and the distribution to individual residences and so on, will be very clear on these issues.

MEMBER McEWAN: So you say on slide 9 that you have ongoing work in the creation of a toolbox of communication products. Would you be prepared to share that with the Commission as it is being developed?

MR. KONTRA: Tom Kontra, for the record.

The Commission is represented on those groups and they are aware of the discussions and we have committed and continue to provide Dr. Binder with periodic updates.

MEMBER McEWAN: So we will be able to see the iterations of those information sheets?

MR. KONTRA: Absolutely.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: Thank you, Mr. President.

A few questions for the Office of the Fire Marshal and Emergency Management. As you develop this communication material, particularly for Ontario and close to the city, are you looking at languages other than English? I know Toronto Public Health normally has it in multiple languages.

MR. KONTRA: Tom Kontra, for the record.

I have in a sidebar chastised my spokesperson, because it was in his notes that we are considering multiple other languages. Just as a background in one of our emergency preparedness week programs we actually translated into 20 different languages. I'm not committing to 20 languages at the moment, but we are definitely considering multiple languages in the area.

MEMBER VELSHI: Thank you. And if a decision is made to do the mass mail out, I'm assuming, maybe you can confirm, that your program would look at verifying the receipt of this and whether you do spot checks and make sure that people are actually getting it and not discarding it as junk mail?

MR. KONTRA: Those are all considerations and they are the reservations we do have with the mail-out program, so we are discussing as to how best to assure receipt and retention if that is the option we choose.

MEMBER VELSHI: Thank you.

And for the secondary zone, I know at many hearings -- and you have been there and you have heard it as well, that there are a number of members of the public who have expressed interest in getting access to KI pills. So is that option available that someone can go to their pharmacy and just ask for it, or is it only during an emergency would they have access to it?

MR. KONTRA: No. As we have indicated, we are calculating their reserve percentage so that we can provide it on demand.

MEMBER VELSHI: Thank you.

And my last question, you know, the Commission asks for things to be done, but it would be kind of nice to know, how much is this whole endeavour likely to cost?

MR. KONTRA: Tom Kontra, for the record.

It is going to cost more than my pay grade ever controlled. Unfortunately I don't have the figure at the moment. OPG and the other facilities are in the process of acquiring the pills. Once the pills are acquired we will have a better idea and of course the distribution method will also add to it.

Current estimates, if you need to look at the numbers of households, if we were to mail, I would say

a conservative estimate is a couple of dollars or more for mailing, if we were choosing a secured mail option, then it will be somewhere in the $5 to $10 range, so multiply that by many thousands of households and we are talking a lot of money. I would expect we are probably going to be in the millions.

MEMBER VELSHI: I think for a future update, maybe closer to the end of the year, it would be a good piece of information to share with us, please.

MR. KONTRA: By the next quarter when we will have -- or at least the facilities will have purchased or issued the purchase order we will be able to give you at least the cost of the pills.

MEMBER McEWAN: Thank you.

THE PRESIDENT: Thank you.

Okay. Anybody else? Mr. Tolgyesi...?

MEMBER TOLGYESI: Just one more.

This is to New Brunswick. On the staff presentation, page 6, you are saying that currently there are stockpiles in five locations beyond 20 km and three beyond 50 km. Are these three included in the five, because it is beyond 20 km or it's not?

MR. MacCALLUM: These are all beyond the 20 km distance and they encompass the City of Saint John and a couple of other communities that are not found in the

emergency planning zone but potentially could be of concern.

We have off the southern coast of the provinces well a couple of island communities, Campobello Island and Grand Manan. Stockpiles are located there for obvious logistics reasons and these are all outside the 20 km emergency planning zone.

MEMBER TOLGYESI: Are there reasons to stockpile beyond 50 km, because it is quite far away when you consider that.

MR. MacCALLUM: We have -- did you say beyond 50, sir?

MEMBER TOLGYESI: Yes, because you have three locations of stockpiles beyond 50 km. It is because you expect that it will be needed or just because you stockpile there, but it will be not used by populations beyond 50 km?

MR. MacCALLUM: The perception was that, if you would like to characterize it as due diligence, just to be certain because of in some instances, as I mentioned, islands that might be inaccessible under certain circumstances, just as a precaution we did go out further to ensure that those stockpiles were widely available.

THE PRESIDENT: Monsieur Harvey...? Dr. McEwan...? Ms Velshi...?

So let me add also congratulations to the work being done, I think it's terrific. As regulators we just like to see things, but you guys are the experts in the implementation and I think a lot of good work is done.

I don't think it's going to be one line of communicating with a population left to be through mailing, website, whatever else. I will never forget the Fire Marshall telling me, “We are the fire people. We go door-to-door”.

So I think this is an office that there is a lot of expertise in dealing with household -- almost on a household-by-household basis, so I think they will come up to the challenge.

And we are very interested in the communication aspect, because my view is that there will be a segment of the population that will view the KI distribution as testimony that this is a risky business, nuclear, and to try to explain that this is really a cautionary move rather than a likely occurrence is going to be a challenge. So we would like to see the kind of messaging and we would welcome the opportunity to do so. So all in all we look for the next update and thank you for this update for now.

Thank you very much, we are going to take a lunch break and we will resume at one o'clock.

--- Upon recessing at 12:01 p.m./
Suspension à 12 h 01
--- Upon resuming at 1:04 p.m. /
Reprise à 13 h 04

CMD 15-M14
Oral presentation by
Natural Resources Canada, AECL and CNL

THE PRESIDENT: Good afternoon. We are back and the next item on the agenda is a presentation by Natural Resources Canada, Atomic Energy Canada Limited and the Canadian Nuclear Laboratories on the restructuring of AECL and CNL. This presentation is outlined in CMD 15-M14.

I understand, Dr. Walker, you will make the presentation. The floor is yours.

DR. WALKER: Thank you very much, Mr. President. I will be sharing the presentation with my colleagues.

Members of the Commission, good afternoon.

For the record, my name is Bob Walker and I am President and Chief Executive Officer of Atomic Energy of Canada Limited and of Canadian Nuclear Laboratories Limited or CNL, which is presently a wholly-owned

subsidiary of AECL. With me here today are Jonathan Lundy, AECL's Chief Transition Officer and Jean-Frédéric Lafaille, Director General of AECL Restructuring at Natural Resources Canada.

Together we are here to provide an update to the Commission and to respond to Commission Members questions regarding the status and plans for the restructuring of AECL. Dr. Lafaille and I first came to the Commission in December of 2013 to present an overview of the restructuring and to discuss its regulatory implications.

Today our update will focus on three key areas. First, the restructuring of AECL; second, the recent government decision regarding the future of the NRU reactor; and third, regulatory considerations associated with the restructuring and the NRU.

To begin our update today I will take a moment and discuss the breadth and scope of CNL and its various sites and activities. Building on AECL's 60-plus years of nuclear science and technology accomplishments, CNL maintains a national presence with over 3,400 employees working in four provinces.

Les employés hautement qualifiés de LNC offrent un large éventail de services nucléaires d'une importance vitale afin d'arriver à un résultat stratégique

que les citoyens du Canada et du monde entier puissent bénéficier de la science et de la technologie nucléaire au niveau de l'énergie, de la santé, des avantages économiques et environnementaux, tout en ayant confiance que la sécurité et la sûreté nucléaires sont assurées.

LNC entreprend une série de programmes qui ont été mis en place pour étendre ce résultat stratégique. Ces programmes sont en accord avec les priorités du Gouvernement du Canada, plus précisément, de supporter un environnement propre et sain, d'avoir des citoyens canadiens en santé, un Canada sécuritaire et sécurisé, et une économie innovatrice fondée sur le savoir.

Importantly, following CNL's restructuring, the laboratories will continue to deliver on three distinct missions, managing Canada's decommissioning and waste management responsibilities; delivering science and technology to meet core federal needs; and supporting Canada's nuclear industry by providing access to CNL's science and technology facilities and expertise on commercial terms.

Carrying out these missions, CNL will remain well positioned to meet all of its nuclear safety and regulatory obligations.

I will now ask Jean-Frédéric Lafaille of Natural Resources Canada to provide additional details on

the restructuring. J.-F.

DR. LAFAILLE: Thank you, Dr. Walker.

Monsieur le Président, Madame, Messieurs les Commissaires. For the record, my name is Jean-Frédéric Lafaille. I am Director General at Natural Resources Canada, or NRCan, responsible for the restructuring of AECL's nuclear laboratories.

J'aimerais tout d'abord remercier la Commission pour le temps qui nous est accordé aujourd'hui. Nous sommes heureux de pouvoir vous présenter une mise à jour au sujet de la restructuration qui fait suite à notre présentation de décembre 2013.

Ceci dit, il y a un processus d'approvisionnement en cours, et certaines informations sont confidentielles, et nous ne serons pas en mesure de les divulguer publiquement.

Nous tenons à garder la Commission informée, et nous nous efforcerons de répondre à toutes les questions et préoccupations selon le moyen le plus approprié.

Ce que je peux affirmer sans l'ombre d'un doute est que la sûreté nucléaire est et demeurera notre priorité à travers le processus de restructuration.

Si on reprend le fil de l'histoire, le gouvernement a amorcé la restructuration en 2007 en lançant

une revue complète d'EACL.

La restructuration a été divisée en deux étapes : la première, afin de vendre les actifs de la Division des réacteurs CANDU d'EACL, ce qui a été complété en 2011 lorsque CANDU Énergie, une filiale de SNC Lavalin en a fait l'acquisition.

La deuxième étape de la restructuration est en cours et vise à mettre en place un modèle d'organisme gouvernemental exploité par un entrepreneur -- ce qu'en anglais on nomme government-owned, contractor-operated, ou GoCo -- aux laboratoires nucléaires d'EACL, implanté ce nouveau modèle aux laboratoires d'EACL.

Natural Resources Canada is leading the restructuring on behalf of the Minister of Natural Resources and we are working very closely with AECL and CNL to make this happen. Throughout the process we have been in discussion with CNSC staff who are kept informed of our progress and able to provide advice as appropriate at key juncture points of the restructuring. CNSC staff has been very collaborative, which I wish to acknowledge.

Slide 5. Looking at the restructuring of CNL from the government's perspective, this slide illustrates the organizational transformation of the nuclear laboratories. Today we are in the interim state shown on the centre of this chart. In 2014, CNL was

created as a wholly-owned subsidiary of AECL. Through an international -- internal, sorry, reorganization CNL became the operator of the nuclear laboratory and licensee. For now, the Board of Directors of CNL has the same membership of that of the parent crown corporation, insuring alignment and direction and oversight of the operating business.

At the end of the restructuring process, at a GoCo end state shown on the right side of the chart, the ownership of CNL will change from AECL to the contractor that is selected through the government-led procurement competition that is now underway. The contractor will appoint a new CNL Board of Directors and the relationships that AECL has with both the contractor and the CNL would be contractual in nature.

I will move on to slide 6. Thank you. This slide depicts the roles and responsibilities of the parties to the GoCo arrangement once the restructuring of AECL is completed.

NRCan will continue to set policy for the government. AECL as a crown corporation will ensure the government's objectives for the nuclear laboratories are met.

AECL will be the main customer of CNL and will oversee the contract and CNL's performance. AECL will remain the owner of the sites, facilities, assets,

individual property and decommissioning liabilities.

The contractor will be the private sector companies selected to own 100 percent of CNL's shares. It will appoint CNL's senior leadership team and Board of Directors, and will earn fees based on CNL's performance. CNL will continue to be the operator and licensee. It will continue to be in full control of the day-to-day operations as it is today, and accountable for its performance.

CNL will also have the authorities required to make all operational decisions at the nuclear laboratories, including those related to safety. It will have the qualified personnel, systems and processes needed to carry out its missions.

As a licensee, CNL will maintain its important relationship with the CNSC and will be fully responsible for meeting its regulatory obligations.

CNL will be the enduring entity and the employer of the workforce. It will maintain its core capabilities and expertise over time and be positioned to carry on through potential future changes in its ownership.

To slide 7, as we proceed with the restructuring and implementing the GoCo model, two parallel streams of work are in progress. First, the procurement process that is led by Public Works and Government Services Canada On Behalf of NRCan and, second, the internal

reorganization of AECL as it prepares to the transition to the GoCo model.

The procurement process is now well underway. The request for response evaluation which is prequalification and consultation stage for the potential respondents, concluded in late January 2015. At this stage, prospective respondents' qualifications were evaluated to assess whether they met technical, financial integrity and national security requirements. Respondents who satisfied these mandatory requirements were deemed as qualified respondents. These qualified respondents were then invited to engage in detailed confidential consultation with government.

Over the past several months, qualified respondents have improved their understanding of the expectations and details of the procurement. Separately, government has refined its requirements, determined terms and conditions to protect the interests of government while being commercially acceptable. Four qualified respondents have completed this prequalification process. Public Works and Government Services Canada have made their names and team compositions public on its website buyandsell.gc.ca. We have recently advanced to the request for proposal or RFP stage.

In late January the RFP documents were

issued to the four qualified respondents. The bid evaluation process will be conducted in the spring, with the preferred bidder expected to be confirmed this summer and the contract awarded in the fall of 2015. Bids will be rigorously evaluated following processes and protocols established by Public Works and Government Services Canada. The government will be selecting the qualified bidder that demonstrates that it can best manage the complex CNL operations.

Je vais maintenant passer la parole à messieurs Lundy et Walker, qui fourniront davantage de détails sur la restructuration interne au sein d'EACL. Merci.

MR. LUNDY: Thank you, Jean-Frédéric.

For the record, my name is Jonathan Lundy and I am the Chief Transition Officer for AECL.

In conjunction with the procurement process, AECL is undertaking an internal reorganization. Nearly 10 months ago CNL was legally created as a wholly-owned subsidiary of AECL and last November 3rd the organization was stood up. As part of this, the licences, permits and exemptions held by AECL were transferred to CNL. The CNL Board of Directors was appointed through cross appointments with the already existing AECL Board and Bob Walker was appointed President and CEO of CNL.

Effective November 3, 2014, the Nuclear Laboratories Leadership Team and employees were reorganized into the subsidiary and AECL's management systems, contracts, et cetera, were migrated as well. Our license transfer applications described these changes in detail. A dedicated project team manages ongoing transition activities internally.

Last June I was charged with creating the new, smaller Crown Corporation (AECL) that will ultimately act as the main customer for CNL and manage the GoCo contract and agreements. To date I have recruited an Executive Leadership Team, many with deep GoCo experience. Staffing is continuing and I am confident AECL will have its full complement of approximately 40 to 50 employees on board in the next few months.

My team is making excellent progress putting in place the business infrastructure that AECL will need. The policies and core procedures that will govern the future AECL operations, as well as key business systems are on target to be formally implemented starting this April 1st.

AECL and CNL both recognize the value in building and testing the interfaces between the organizations and our teams in accordance with the commitments we have made to each other under an interim

services agreement. We are currently focused on establishing priorities for the coming fiscal year and developing a reporting framework, as would be appropriate for a customer and a supplier to do.

In the time leading up to share transfer, we will assess how well we are doing through what we are calling stress testing. This will help us to build relationships between the people who will be interacting frequently, provide opportunity to test and adjust business interfaces and ensure that information exchanged and plans set meet their respective needs. While in a contractual relationship, AECL and CNL share a common goal to see CNL thrive under the GoCo model.

This table provides an overview of the timelines for the restructuring going back to 2014 and moving to the fall of 2015 when the signing of the contract is anticipated. I won't go into detail as many of the identified milestones have been discussed in previous slides. I will note, however, the upcoming announcement of the preferred bidder in the summer, as well as the signing of the contract with the contractor expected in the fall of 2015.

I want to amplify this period of time a little further because during the summer, after the preferred bidder agreement has been signed, AECL, CNL and

the preferred bidder will be working collaboratively on leadership transition which will be managed in an orderly fashion through CNL's current change management process. This is an incredibly important activity. I want to stress that we will not sign final contracts until we have certainty that an effective transition can occur.

I will now turn the presentation back to Dr. Walker and Dr. Lafaille.

DR. WALKER: Thank you, Jon. For the record, my name is Bob Walker.

I want to begin by reemphasizing Jon Lundy's last point that effective leadership transition is extremely important and will be a core priority for me. Continuous engagement in communication with our employees has been at the forefront of our efforts over the past year and a half. Our focus and message is clear. Nuclear safety is and must continue to be our overriding priority.

We recognize that organizational change can distract a workforce and we are actively working to keep people informed, engaged and focused. As the GoCo implementation approaches we are ramping up our two-way communications. We are making sure that all CNL managers are equipped to discuss the restructuring with their teams. We are ensuring a greater presence of management and supervision in the field and we are increasing promotion of

safety messages. Likewise, my engagements with CNL local union leaders and national representatives have increased.

In terms of industry I have also personally met with our customers and other members of Canada's nuclear sector who have significant stakes in the laboratories. As part of our public information program, we have been meeting with elected officials and business leaders from host communities near our Chalk River, Whiteshell and Port Hope sites.

NRCan and Public Works have also been engaging local stakeholders on the subject of restructuring and the procurement process. It suffices to say that communication is very important and we will continue to keep the public informed about the restructuring process and its timelines through our public information program.

I am going to now ask Dr. Lafaille to speak to government's decision on the future of the NRU reactor.

DR. LAFAILLE: Thank you.

Pour le procès-verbal, mon nom est Jean-Frédéric Lafaille.

While not directly related to the restructuring, I want to take a moment to talk about the recent government announcement regarding the future of the NRU reactor.

In February 2015, the Government of Canada announced its support for the continued operation of the NRU until March 31, 2018. This continued operation is of course dependent on the licensing and regulatory approvals by the CNSC.

The announcements also reiterated that the NRU will cease the routine production of the key medical isotopes molybdenum 99 on October 31, 2016 as previously planned and announced. This is part of the government's broader strategy to ensure the security of supply through a more diversified and robust market.

The government’s isotope strategy has been threefold. First, support NRU production until October 2016; second, encourage development of alternative production technologies which have shown much progress towards commercialization in the near future and; third, sustain engagement to improve coordination of global supply and more efficient use. As a result, the global market has diversified and has become more robust.

That said, recognizing that there could be tightness in the global supply of molybdenum 99 between 2016 and 2018, the government has asked CNL to maintain the NRU’s capacity to produce molybdenum 99 in the unexpected event of a global shortage that could not be otherwise mitigated through other means. The Nuclear Energy Agency

of the Organization for Economic Cooperation and Development forecasts of supply and demand for molybdenum 99 after 2018 will be met through new sources of supply globally, and the risk of shortages will be reduced significantly.

Now I'll pass the presentation back to Mr. Walker, who will address implications of this decision for CNL.

DR. WALKER: Bob Walker, for the record.

In light of government's decision, CNL has begun to adjust its plans for operating NRU for the next three years and for its subsequent shutdown. Throughout this operating period, we will ensure that employees, unions, customers, collaborators and host communities are kept fully and regularly informed of these plan adjustments as they unfold.

Three more years of operations provides us time to adjust. However, we also recognize the importance of finalizing and communicating our adjusted plans in the coming months.

Our employees, our customers and collaborators and our regulators will want and require this clarity.

It is CNL's intention to take full

advantage of the expected remaining three years of NRU operations to maximize benefit for external customers and for CNL research programs while ensuring our obligations to operating safely are fully met.

We will continue to meet our obligations to safely and reliably operate and maintain NRU through to its very last day, including meeting our commitments to the CNSC as set out in our licence and as described in the Integrated Implementation Plan, or IIP.

We have completed initial scoping assessments in four areas to help us determine our course for the future.

The first area is operational impact. We initially -- have initially looked at the impact on operations and shutdown requirements for NRU and supporting facilities, including the impact of moly-99 production standby and implications for our current graceful exit plan for our moly-99 mission.

We have revised our priorities for 2015-16 to ensure continued safe, reliable operations while producing deliverables required to support licence extension of the NRU until March 2018.

The second area is to maximize NRU usage. We have engaged customers to determine how

best to adjust plans to make maximum use of NRU services through to March 2018, including opportunities to accelerate research and irradiation campaigns.

We are preparing for three more good years of NRU usage to meet internal and external customer needs, work which will also mitigate the impact of the neutron gap period, that is, that time post-NRU shutdown when we will not have a research reactor available.

The third area is around the neutron gap impact. We have conducted the initial scoping assessment of the implications for our core research and development capabilities following NRU shutdown.

The NRU directly supports and enables three of CNL's 10 scientific Centres of Excellent, or COEs. Our initial scoping studies have confirmed that much of the core capabilities in these three affected COEs can be sustained for a gap period of up to 10 years, for example, through the judicious use of international collaborations. And we are adjusting R&D projects in some cases to ensure we maximize use of the available reactor time to progress irradiation campaigns that will, in turn, support our research and development activities for years following the NRU

shutdown.

The final and most important area is people impact. We have explored initially how all of the above affects our people, their employment and their personal needs informed by our scoping in the other areas. There is more work to be done.

The key principle that is underpinning our approach is to retain, retrain and re-deploy our people to the maximum extent possible in response to evolving company needs and opportunities.

We recognize and acknowledge the need to be able to demonstrate with confidence that we have the trained and competent people to safely and reliably operate the NRU through to its end of life and to move the reactor to its safe shutdown consistent with our licence conditions. We are committed to do so.

Moving forward, CNL has three key licensing actions in the coming year with respect to the Chalk River laboratory's research and test establishment operating licence.

First, we will address the future of the NRU reactor in our submittal in response to site licence condition 16.3, which is due 30th of June of this year.

Second, we will submit information related to our 2014 performance of our licence activities at all of our CNL sites in April of this year as well.

Third, we will make an application in the fall of this year, 2015, to amend the expiry date of the Chalk River licence such that it will coincide with the date of the NRU shutdown March 31st, 2018.

We recognize that these three matters are tightly intertwined and, having conferred with CNSC staff, suggest that these items be brought forward to the Commission for consideration in a single public hearing approximately one year from now.

At the time, members of the new leadership team that the GoCo contractor installs to manage and operate CNL on a day-to-day basis would be present to speak for the organization's commitments.

In closing, I offer the following conclusions.

Nuclear safety remains our overriding priority. Restructuring is well under way. The procurement process is unfolding as we speak, with selection of the preferred bidder expected in the summer and contract signing in the fall of 2015.

As you have heard today, AECL has been

reorganizing itself to prepare for the implementation of the GoCo model. A very important step, the stand-up of CNL, was achieved last November.

We are very conscious of the need to keep our stakeholders and, most important, our employees informed and engaged.

Finally, we are in the process of responding to the recent government announcement on the NRU and are factoring this decision into our upcoming licence submittals to the CNSC.

Mr. President, our team will now be pleased to take your questions and those of the Commission members. Thank you.

THE PRESIDENT: Thank you. Thank you for this presentation.

So let's jump right into the question session, and let me start with Ms Velshi.

DR. NEWLAND: Excuse me. Could I make a few remarks?

THE PRESIDENT: It says here you didn't want to make remarks, so I'll ask you. Do you want to make any remarks as CNSC staff?

DR. NEWLAND: Yes, please, I'd like to make a few remarks.

THE PRESIDENT: Okay.

DR. NEWLAND: Good afternoon, Mr. President, members of the Commission. My name is David Newland, and I am the Acting Director-General of Directorate of Nuclear Cycle and Facilities Regulation.

I have with me today Mr. Christian Carrier on my left, Director of the Nuclear Laboratories and Research Reactors Division, Ms Karine Glenn, Director of the Waste and Decommissioning Division, and Ms Kim Campbell, lead technical advisor with my office.

I would like to take just a few minutes to add some remarks to complement the presentation that you have just heard and to explain some of CNSC staff's activities going forward and CNSC staff's role in the procurement process.

First and foremost, I would like to underline that CNSC staff continues with its usual day-to-day regulatory compliance activities for all of CNL's licences, including site inspections, desktop reviews, et cetera.

At the same time, we are planning for the future. There are two aspects to this, changes in our compliance program for CNL and, secondly, planning for upcoming licensing activities, in particular the

relicensing of Chalk River laboratories that you have just heard referred to.

With respect to the first, we know that the incoming contractor will want to initiate significant changes in CNL. Accordingly, we will be modifying our compliance oversight to pay increased attention to organizational changes and the rate of these.

In addition, we will increase our oversight on the licensing resources and capabilities.

One of the reasons that we are considering these changes is based on our discussions with our regulatory counterparts in the UK, the Office of Nuclear Regulation. The experience in the UK using a GoCo model that is similar to the one being adopted here has shown that it is important for the regulator to tailor its compliant activities to the GoCo model. That is what we are currently planning to do.

With respect to upcoming licensing activities, there are two significant milestones.

The first is licence condition 16.3, which states that:

> "The licensee shall, by June the 30th, 2015, develop and submit for approval by the Commission a plan

> for the end of operation or continued operation of the NRU reactor beyond October 31st, 2016."

As you are aware, the Government of Canada has stated that NRU will cease operation in March 2018, and we, as you have heard, expect that CNL will be submitting an end of life plan that reflects this decision in accordance with the licence.

The second milestone is the upcoming renewal of the CRL site licence, which expires October 2016.

As you have heard, CNL is proposing that both matters be considered, including the application to amend the expiry date of the licence, in a Commission hearing in spring of 2016. CNSC staff supports such an approach and the timing thereof.

CNSC staff are currently working with CNL to establish the timeline for application submissions to meet a schedule of spring 2016 for this hearing.

I will now briefly outline staff's role in the procurement process.

First, staff has provided to NRCan advice related to our regulatory mandate, the

regulatory framework, the regulations and the Commission's licensing process.

Secondly, we have participated in meetings with qualified respondents on an as requested basis to discuss in general terms regulation and licensing in Canada.

Some of these bidders, while experienced with -- very experienced with regulated nuclear activities and facilities in other countries, are not necessarily acquainted with the way in which we regulate in Canada.

These interactions were done under pre-established rules of engagement that ensured fairness to all bidders and protect the independence of the Commission and the CNSC as a regulator.

Finally, I wish to re-emphasize that, throughout the procurement process and our interactions with all parties, CNSC staff continues to maintain its arm's length regulatory relationship and its independence.

Thank you, and that completes my remarks.

THE PRESIDENT: Thank you. Thank you very much.

So let's now jump to the question

period with Ms Velshi.

MEMBER VELSHI: Thank you. And thank you for your remarks. You answered many of the questions I had for you.

So a follow-up to what you said about your role in the procurement process, you said the information that you provided NRCan was on an -- sort of a requested basis. So have the bidders asked to meet with the regulator and get more familiarity with Canada's regulatory regime?

DR. NEWLAND: Dave Newland, for the record.

Yes, as part of the RFP process, PWGSC, NRCan offered to have the CNSC participate in joint meetings with the qualified respondents and offered to have us meet with them one on one. I would say there's been a pretty limited engagement with us, but I think it has been useful for them, nevertheless.

MEMBER VELSHI: And as you develop your transition plan, particularly the change management plan, is the regulatory orientation a component of that for the new focus of GoCo?

DR. LAFAILLE: Thank you for the question. Jean-Frédéric Lafaille, for the record.

Yes, very much so. So Dr. Walker or

Mr. Lundy, I don't remember, talked about the announcement of preferred bidder some time in the summer.

Following that, a number of conditions will have to be addressed before the shares are transferred to the selected contractor. Part of this process will be to ensure that the transition is done properly so all the regulatory requirements are met so there will not be a transfer of CNL to the private sector without ensuring that all the regulatory requirements would have been observed at this time.

And maybe I can pass along to Mr. Walker to specify.

DR. WALKER: Thank you for your question.

We have well-established change management procedures we follow when there's any organizational change to the company. Those are part -- an intense part of our management system that, regularly, the CNSC staff come back and examine to ensure we're following our procedures.

It's very much our expectation that those procedures, the ones that exist today, will be used by CNL in consultation with AECL and the preferred bidder to ensure that we have an established

organizational change procedure, particularly with the change in leadership, that meets that standard to the point that we would not be moving forward to complete the share transfer until we're comfortable that that's been satisfactorily completed.

So that's the key concept here.

Now, obviously the contractor coming in place has other products that it has to deliver that say what happens post-share transfer that deals with subsequent change it may want to implement. That would, of course, be done under the watch of the new leadership team.

Jon, did you want to make any additional?

MR. LUNDY: Well, I think I want to maybe focus on J.F. and Dr. Walker were talking about what happens sort of before share transfer.

As you know, we are looking for -- the government is looking for, really, change in management and that -- and transformational change, I think, is sort of what has been in a lot of the documentation.

That is something that is measured in years, not immediately. That's something that will occur over time and with the processes that are

inherited on day one.

And what -- it's important that CNL -- you understand CNL is an enduring entity, so the contractor will be coming into that entity and, on day one, will be existing with everything that the CNSC is familiar with, with the same management system, with all the processes and the management change, and the rigorous management change program that is currently in place and will -- any change that does take place after share transfer will be done through those types of processes and with interaction with the Commission as necessary.

MEMBER VELSHI: Thank you.

My question was very specific on bringing the new folks up to speed on Canada's regulatory regime. And I hear you. I mean, your change management process would -- when you address it systematically will identify that.

But -- and I've been involved in some transactions and divestment of nuclear entities, and that's been a very steep learning curve for many folks who've come from outside Canada, so -- which is more on making sure that staff know that there may be work coming your way. And certainly the CNSC President, too, would be involved in that, but that there's a big

piece of work there.

Dr. Walker, you talked about the communication plan and, on slide 13, the different stakeholders that you have met with. I was particularly interested in industry and customers and any concerns that they may have raised around the GoCo model, if any, or reservations or precautions.

DR. WALKER: Bob Walker, for the record.

We've had ongoing discussion with our industry colleagues for a number of years with the restructuring of AECL, beginning with the divestiture of our CANDU reactor division now with the nuclear laboratories.

The first comment I'd have is that our industry colleagues and customers are extremely pleased that the government has conferred the ongoing mandate to be able to provide commercial services to industry.

It's also very much pleased to see the anticipated and already under way capital reinvestment in Chalk River science and technology facilities.

Clearly, it is looking for clarity around matters such as pricing as we move forward, and that, of course, will be top of mind issues as we move

into the contractor model.

That said, our industry has also come together to establish a new vision for where it wants to go and sees science, technology and innovation as a core part of that and, in a broad term, very much favours the creation of a national laboratory as a bit of the brain trust to backstop that.

MEMBER VELSHI: And my last question --

THE PRESIDENT: Well, just on that, but I assume from what we hear, they still are meant the uncertainty in having a nuclear reactor that can put some tests or some equipment facilities, et cetera. So that's what I -- that's what we hear.

So they really would like a substitute because, otherwise, you know, some of the tests, some of the equipment, some of the aging management they are doing without a reactor, how are going to do that?

So I'm sure you must have received this in spades.

DR. WALKER: Bob Walker, for the record.

In spades? I -- certainly we have had a large research reactor at Chalk River for decades, and so a period of time without a research reactor

will require adjustment.

As I've indicated, our belief is that we can sustain our core capabilities that the reactor otherwise supports for up to about 10 years. If there is not a replacement reactor, then we will look different going forward.

I believe this is a substantial issue that is -- engages the contractor, CNL, governments and industry, and perhaps the fact that we have clarity on the remaining time life of NRU and when we know a neutron gap will now start provides a frame of reference for those discussion to occur.

However, I do want to emphasize the point that the NRU supports three of our 10 Centres of Excellence. We have many, many other important dimensions that are the backbone of this industry, and the fact that we have significant investments coming forward by the Government of Canada to maintain those capabilities is also recognized and valued.

So it's not an entirely yes/no kind of situation. There is positives here. We know we have a neutron gap, but my direction right now is to make sure that we can mitigate the impact of that.

The question on a research reactor, I think, is a matter for going forward, and I don't know

if Jean-Frédéric wants to comment on that, but...

DR. LAFAILLE: Jean-Frédéric Lafaille, for the record.

I would echo what Dr. Walker just mentioned. Government looked at all considerations before making the decision, has engaged industry and other stakeholders and come up with the decision that it was the case to extend the life of NRU until March 2018, which will provide an horizon of three years to -- for industry and other stakeholders to come up with ideas in terms of how to maintain the best capabilities and expertise in Canada to meet their needs.

And we will be listening and engaging with them to have these discussions.

THE PRESIDENT: Thank you.

Ms Velshi?

Dr. McEwan.

MEMBER McEWAN: Thank you, Mr. President.

I guess a couple of questions. Dr. Lafaille, you said you picked March 2018 because of the OECD report, the NEA report from a little while ago. My memory of that is that that 2018 figure is very soft.

It's dependent upon a rapid return to service of BR-2. It's assuming that Jules Horowitz will come on line a little bit early rather than a little late,

and the patent doesn't have any further liability issues.

The 2018 date, is it now fixed in stone or will you monitor NEA reports and think further as those data become available?

DR. LAFAILLE: Jean-Frederic Lafaille, for the record.

In terms of the data, I think there will be a number of considerations at play, and not solely the NEA report. We look at the NRU as research reactors that have many functions. And looking at the entire case for extending or not the life of the NRU, the operation of the NRU, the question of course medical isotopes came into play.

Based on the information we have to seize the routine production of molybdenum-99 October 2016 as the government had previously indicated was important in our mind.

This being said, because there was a case to extend the operation of the NRU, given the NEA report I mentioned to you, it was judged prudent to give NRU the capacity to produce molybdenum-99 should there be concerns such that there would be no other source in the system and no other mitigation strategy available and there would be a need for the health community to resume the production of the NRU for

molybdenum-99.

We will look at the projections of the NEA. People will debate about the assumptions and their risk factors. But the bottom line, when we look at the graph and, importantly, the balance between supply and demand, supply is still expected to meet demand.

The question is are there risks in the system? And the government, recognizing there are risks in the system, went with a prudent assumption to keep the NRU as an insurance policy should there be such needs.

So the government's position is that we look at all options available should there be a shortage after 2016. The NRU will be there until March 2018 as an insurance policy should there be need for that.

I will monitor closely the evolution of the market and we will see what are the best mitigation strategies going forward. But the current government's position is that the NRU will shutdown after March 2018.

MEMBER McEWAN: Thank you. And, Dr. Walker, we talked about the reactor. Is there going to be any problem in maintaining the processing

facilities on standby for that period? It seems to me that that also is a potential weak link in this plan.

DR. WALKER: Bob Walker, for the record.

Thank you for that question here, Commissioner.

So we have associated facilities with the NRU that are making up the entire package including our molybdenum production facility, and that has been frankly when we had received the direction to end our molybdenum production in October 2016 has been a big part of our focus, which is the graceful wind down of the capability, the people in the facilities associated with the molybdenum processing facility. It has been a bit of the lynchpin issue.

And we had a maturing approach by which we were going to do that, including opportunities to redeploy the workforce that are associated with it, and efforts that would be needed to put the facility into safe shutdown.

Our initial views and assessments are what are the implications of delaying that by the approximate 18 months that would be associated with it? And what would be required to be able to ramp up production? Because our assumption is that if the

government requested us to do so, it wouldn't be in a day, it would be with some lead time. So how much lead time to keep that forward?

So the initial view is that we can manage this, but we need to mature our plans in this regard in the near future. This notion that while we have time to adjust, we really don't have time to wait for our planning, and these are key considerations that are in active discussion, including with our employees and unions directly affected.

MEMBER McEWAN: I guess for Staff, do you see any problems in licensing the processing facility under these slightly unusual circumstances where it may be used, it may not be used?

DR. WALKER: Bob Walker, for the record.

Not at this point.

MR. NEWLAND: Dave Newland, for the record.

So we were approached back last summer about whether this was a possibility. And we looked at it and we considered that it was. We recognize that it is somewhat unusual, and we will work with CNL to ensure that we understand how quickly they may need to bring it back up.

And it may be that there would be additional provisions that we would need to put into place in terms of compliance, et cetera.

So I will ask Mr. Carrier to add some detail.

MR. CARRIER: Christian Carrier, for the record.

So we have been in discussion with CNL on this matter for a little while. Over the last year actually we were mostly planning on the winding down of the molybdenum-99 processing facility, and it came as a bit of a surprise.

But we have been looking into it. We recognize it will be a change in paradigm, in operating paradigm for CNL and we will need to adjust ourselves. So the facility will be available on demand, we will need to look at staffing, continued maintenance, and continued occupancy. There is also security and safeguard consideration in there.

Anything is feasible, and I think it is achievable. But we will need to adapt ourselves and change our monitoring and oversight over the facility.

THE PRESIDENT: Let me ask. You know, the March 2018, while honouring the government's

announcement and not trying to make any comments whether this is a good date or not a good date, does it make sense to have the safety case, however, to go slightly above?

Because in the safety case, the difference between March or December of 2018. I don't know if it will make any difference, it will give you guys more flexibility while still honouring the government intent.

Because I am worried about a planning target date being the same thing as a safety case. You know, like to plan for decommissioning to start exactly on that date. To me, if you back it up, it can cause all kind of -- it will be inconsistent with ability to be on standby until March 2018.

So you may want to think about how the safety case relates to this date of March 2018. Just a suggestion.

Dr. McEwan?

Monsieur Tolgyesi?

MEMBER TOLGYESI: Merci, Monsieur le Président.

On slide 3 you were mentioning there three missions for CNL: 1 is the waste decommissioning and managing the waste; the other one

is delivering science and technology, and support Canada's industry through access to CNL facilities.

Are these two science and technology missions related to NRU?

DR. WALKER: Bob Walker, for the record.

The NRU is one of multiple facilities we have at our Chalk River Laboratories to support both those missions, but there are many many others. As well, we have some 50 unique facilities at the Chalk River campus that are part of the licence that contribute to both of these.

Another way we view this, we have 10 scientific centres of excellence that actually service the needs of both those missions. In fact, also provide the science and technology backdrop to our decommissioning mission as well.

And as I have indicated in my remarks, the NRU supports three of those 10 centres of excellence. It is not the only facility supporting those three.

So to give you a bit of a sense of the scope. So, yes, there will be an impact to not having NRU on our capabilities in those three centres of excellence, by consequence on those missions. But

there is still a substantial capability at our Chalk River campus that will meet broad customer needs.

MEMBER TOLGYESI: So these 10 centres of excellence which are independent of NRU, because those three probably they are connected. But these other centres of excellence, are activities of these centres classified as commercial right now or they are sole purpose of the AECL?

DR. WALKER: Bob Walker for the record.

Indeed the NRU support for the three centres of excellence actually plays back into needs of government science and as well for the needs of commercial business.

Now, I can give you a couple of examples where in fact the accelerated research programs are underway as part of our federal science and technology program that is now being formulated that will be that second mission that you have made reference to.

We have recently initiated four large projects that are providing foundational information that actually will be enabling the CNSC staff to provide regulatory -- have appropriate regulatory science information that relates to, for example,

CANDU pressure tube life.

So it is in this case where the work of the NRU is actually supporting research that is actually supporting the federal role in regulation.

At the same time we have important work going on in the NRU that is looking at validating new fuel types that are at the foundation of commercial opportunities for CANDU industry and international markets. Both of those missions are going on simultaneously within the NRU.

So I trust that has given you a bit of a flavour, but I can elaborate if you so wish.

MEMBER TOLGYESI: So probably the commercial mission of CNL, the part of commercial mission, will increase compared to what is today?

DR. WALKER: Bob Walker, for the record.

Certainly, the Government of Canada has made it clear that by having that commercial mandate, it expects a preferred bidder to grow the commercial business meeting customer needs nationally and internationally.

And with that, of course it has the advantage of an enduring company. It also has the advantage of lower cost to government because you are

sharing the costs of the infrastructure across a larger customer base. So we do expect that part of the mission to grow, yes indeed.

In fact, in the last five years it has grown.

THE PRESIDENT: Just to push you. So if the CNL want to build an SMR, just picking up an example, can they do it on their own or they have to come through the chain of command, AECL to government?

MR. LUNDY: Jon Lundy, for the record.

I think Dr. Lafaille will also want to comment on this.

But the contract is set up in such a way to allow broad -- every year to have annual work plans where there is broad work planned actually on a planning basis 5-10 years, but on an annual basis.

So anything that is consistent with the planning horizon that has been approved by government -- remember, government is funding this already, and these activities, then they will have broad discretion on where and how and what they want to do.

But if it were a very large capital project, government is funding and it would have to be consistent with the policy needs of the government at

the time.

DR. LAFAILLE: Jean-Frederic Lafaille, for the record.

I would echo what was mentioned. I think that to the extent that CNL under this new construct will come up with ideas that would involve government funding to some extent.

Obviously, the government will want to look at the business case, how it makes sense from a policy perspective and from a commercial perspective and would of course look at that, these proposals, and their merits.

But it will be a mechanism through which the new ownership of CNL will be able to look at the possibilities, come up with proposals, which will be reviewed by AECL, and CNL will bring that to the government's attention based on the considerations at play at that time.

THE PRESIDENT: Monsieur Tolgyesi?

MEMBER TOLGYESI: What will be the responsibilities and involvement of AECL in the case of a hypothetical severe accident?

MR. LUNDY: CNL will be the responding unit, they have the flexibility and the staff and the capabilities to handle emergency needs. AECL will be

there to support and to help and to obviously make sure CNL has the funding necessary to respond.

MEMBER TOLGYESI: Does that mean financial insurance, et cetera, will be insured -- supplied by CNL?

DR. LAFAILLE: Jean-Frederic Lafaille, for the record.

Referring to what Jon Lundy said a bit earlier, there will be the annual process of planning for the work to be done by CNL going forward. And to the extent that, I think this is the point of your question, there will be an emergency situation that was not foreseen that would require some quick response and would require let's say additional funding that was not anticipated through the annual process, certainly AECL will be attentive to that and to the extent the government has to respond and provide the funding, we will do so.

Does that answer the question?

UNIDENTIFIED SPEAKER: (Off microphone)

DR. LAFAILLE: Yes, thank you.

So maybe I should add that there are specific requirements related to nuclear incidents. So CNL, as the licensee and operator of the Chalk

River site will be, as any operator of a nuclear facility, subject to the *Act* and will be therefore carrying insurance in that respect.

So this is part of the contractual arrangement in place, so that makes sure the whole proper insurance, should these events occur. And to the extent that there will be events that go beyond this threshold, well the government will be there.

THE PRESIDENT: Let me, first of all, to congratulate NRCan, by the way, for the *Nuclear Liability Act*, after five times -- I think it is the fifth time, I guess, congratulations in clarifying a lot of things.

But I think there is going to be a little bit of a challenge in timing here when it is coming into force and when the old regime applies and when the new regime. And I understand there is work going on between the two organizations to try to clarify that issue. We don't foresee it to be a problem, do you?

DR. LAFAILLE: Thank you for the question. Jean-Frederic Lafaille, for the record.

There are indeed, Mr. President, conversations with CNSC Staff to make sure that all is in place to make sure there is no gap between the

current regime and when the new regime will come into force, and as CNL would be transferred to the private sector.

So we don't foresee any issues at this time, and the approval should be in place to address the situation.

THE PRESIDENT: Monsieur Tolgyesi?

MEMBER TOLGYESI: Just to complete this question, because it will be a kind of special situation. But because you have CNL who is operating, who is its own entity, it is owned by a contractor, that is what I understand, it is owned by a contractor. The other side belongs -- it is property of AECL.

So if there is a kind of hypothetical severe accident, which I think will be kind of severe, it is not just because it was, I don't know, some release of water, et cetera, which is operational things, but severe accident.

How the responsibilities evolve between CNL and the contractor and the AECL will come together, it will be interesting to see how you will manage that and how CNSC also will react.

THE PRESIDENT: Staff, you want to try it?

MR. NEWLAND: Sure. When we had from time to time the opportunity to look at the GoCo arrangement in terms of the agreement between AECL and CNL and the contract, the draft contract I should say, between AECL and the contractor. And one of the things that was important to Staff was to understand who is in control when something happens?

And as far as Staff is concerned, CNL is in control when an event happens. They have access to all of the funding, all of the provisions that they need to deal with an incident should it ever happen.

And that was important that we understood that that was the case in order that they were the controlling mind on a day to day basis and had all the necessary provisions in terms of resources, financial resources, whatever.

Does that answer your question?

DR. LUNDY: Perhaps I can just amplify what Dave said. Jon Lundy for the record.

And what Dave said is correct, is that AECL is the owner, not the operator. We make no day to day decisions, we do not have the staff nor the ability to respond. We will be there to assist and help.

But the operator is CNL and they

clearly would be responsible in this situation. With our assistance, will be standing at the ready to assist and also to make sure that they had everything that the government needed, whether they needed funding, we'd make sure that they had access to that.

MEMBER TOLGYESI: Because when you are looking -- you know, what I am saying it is a special situation -- when you are looking, it is CNL and the contractor and AECL, which is a kind of large organization which will be quite involved in the operations.

When you take an example as Bruce Power. Bruce is the operator, a company responsible, the site belongs to -- probably to OPG if I am right. Okay.

But there is no so close relation, business relation, between OPG I think and Bruce as it will be in your case. So that is why I am saying that will be a kind of challenging situation where it will be interesting to see -- I mean, I hope we will never see that, because it will be no kind of severe incident. But it will be interesting to see, if it happens, how it will be managed, you know?

That is it.

THE PRESIDENT: Thank you.

Monsieur Harvey?

MEMBER HARVEY: Merci, Monsieur le Président.

If there is a shortage in the molybdenum-99 production, who will determine that there is a shortage of importance to restart the production at the NRU? Who will decide? And is it a shortage in Canada, North America or globally?

DR. LAFAILLE: Jean-Frederic Lafaille, for the record.

The decision will rest with the Government of Canada to determine that there is a shortage such that the production of the NRU should be resumed because there would be no other means to address the shortage. So the decision will rest with the Government of Canada.

MEMBER TOLGYESI: And in such event, will the laboratory need the specific authorization from CNSC?

MR. NEWLAND: Dave Newland, for the record.

No, we would not want to put ourselves in that kind of a position. I think we would have an agreement upfront under what conditions they would be able to return to service. So it would be clear to

both CNL and to ourselves, we would not be in that timing loop.

MEMBER TOLGYESI: So there will not be a time gap between the decision and the restarting the production?

MR. NEWLAND: No.

THE PRESIDENT: I like that answer because I'll remind our friend from NRCan that you gave us a directive. We'll never forget that moment. We got a directive to always consider health impact in our regulatory framework. So we want to make sure that there is no gap if people start phoning about shortages and we say go, you guys are able to go.

DR. LAFAILLE: That's it.

THE PRESIDENT: Okay. Thank you.

Back to Ms Velshi.

Dr. McEwan?

Just in terms of your interaction with bidders, you know, just for pure disclosure, we're on the record, particularly with our American friends, that we don't like the relationship between the government and U.S. laboratories and we've said that publicly to anybody who will listen, that the DOE relationship with the Waste Management Whip or the DOE relationship with its own laboratory is not our regulatory framework. So I hope they

understand it and I hope you guys reiterate this. It will come to them as a surprise, I would argue, when we sit down and talk about our regulatory framework versus the DOE.

And if you want to look at the way things are done now in the States about waste management, it just amounts to a restart of a waste repository voyage of discovery in the States, and again, they're separating the military from the commercial thing. So it's going to be interesting but it's a different regime than ours.

My question, though, is I hope that while all of this is going on, and you are doing it really in a time which the government is preoccupied with other things, I sure hope there will be no disruption to some of our favourite programs like Port Hope Cleanup, because, you know, in this transition there's always an impact on employees and we want to make sure that it's going to be as minimal as possible so we can complete some of those projects. You know, in the nuclear business, to get something done on time, on budget would be really nice.

What do you say to that?

DR. LAFAILLE: Jean-Frédéric Lafaille for the record.

Maybe on your first point about the fact that there's a different regulatory regime in the U.S. or in the U.K. or in other countries than some of the team

members of the bidding teams might be accustomed to, we certainly, through the consultation phase of the procurement process, made sure it was flagged many times, the differences, and a lot of documents were put into that room for the qualified respondents to make sure they understood this.

As David Newland said, there was participation of CNSC staff in group sessions to make sure they were aware of all these differences. So I think we took all the measures possible to flag this to the qualified respondents. I'm sure that there will be more interaction with CNSC staff and yourself but I think we took all the measures possible to flag these differences.

So that was the first item I wanted to raise and I'm forgetting the second, where you ended, Mr. President.

THE PRESIDENT: Well, you know, there's a GoCo company commercial outfit coming in.

DR. LAFAILLE: Oh, yes.

THE PRESIDENT: They're trying to make money. I would hope that they -- and again, I don't know how to say it diplomatically -- they don't screw around with the Port Hope project --

DR. LAFAILLE: Yes.

THE PRESIDENT: -- that's going on,

launched and hopefully on the way to being realized.

DR. LAFAILLE: Yes. So maybe two quick things on this.

One is the function of the actual construct we have chosen, the enduring entity, to make sure that there's continuity in work going forward to minimize really the disruption with labour, with the licences. So that was part of it.

This being a transition, so obviously there will be adjustments to be made but we have taken measures to make sure that this transition is as smooth as possible going forward and to make sure that priority files continue to be priority files. You mentioned Port Hope. There are other waste decommissioning projects the CNL has undertaken. We'll make sure that they continue going forward.

And to a point that was made earlier too, we don't foresee changes overnight. It will be a process whereby the new owner of CNL will want to transition in and develop/establish their own plans to answer the government objectives and that will be done over time.

THE PRESIDENT: Okay. Last chance. Thank you.

We will take five minutes.

Marc?

MR. LEBLANC: Yes. If I may, Mr. President.

So if you have interpretation devices, those will no longer be necessary as we're going into closed session.

The closed session will take place in this room. We need a five-minute break to make the room more secure and confidential.

What we're going to do is we're going to split the room in two. So those people who are at the back and who are invited to attend this session, I will invite you to come more forward in the room.

We will be using this door if we need to go out because we're going to close the other access. This will allow the technical crew and the interpreters and the transcribers to be able to undo their material.

We're going to also cut off the webcasting as I speak, at this moment.

So we'll need five minutes to do all this and we'll proceed.

What I need to know, Monsieur Lafaille, is do you want to use the projector for your slide deck? I do have paper copies that we can distribute if you feel this is more secure. You would have to operate the slides yourself. We would use your USB key and we would load it

during those five minutes if it's your preference to use the -- or do we go with paper?

DR. LAFAILLE: To the extent that the Commission doesn't mind flipping the pages, maybe we could do paper.

MR. LEBLANC: Okay, we'll flip pages then. Thank you.

DR. LAFAILLE: Thank you.

THE PRESIDENT: Okay. So this concludes the public meeting of the Commission and thank you all for your patience. Thank you.

--- Whereupon the meeting concluded at 2:19 p.m. /

La réunion s'est terminée à 14 h 19