Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public meeting

Réunion publique

April 12th, 2017

Le 12 avril 2017

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
Dr. Sandy McEwan
Dr. Soliman A. Soliman
Dr. Sandor Demeter

Commissaires présents

M. Michael Binder
Dr Sandy McEwan
M. Soliman A. Soliman
Dr Sandor Demeter

Secretary:

Mr. Marc Leblanc

Secrétaire:

M. Marc Leblanc

General Counsel:

Ms Lisa Thiele

Avocate générale :

Me Lisa Thiele

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Ottawa, Ontario / Ottawa (Ontario)

--- Upon commencing on Wednesday, April 12, 2017
at 9:35 a.m. / La réunion débute le mercredi
12 avril 2017 à 9 h 35

Opening Remarks

MR. LEBLANC: Good morning, Ladies and Gentlemen. Bonjour à tous. Welcome to the public meeting of the Canadian Nuclear Safety Commission.

This morning we have simultaneous interpretation. We would ask that you please keep the pace of speech relatively slow so that the interpreters have a chance to keep up.

We would also ask that you avoid, as much as possible, the use of acronyms as we have two new Commission Members and some of the terms that are of use to all of us all the time may not be as known to our new Members, although they both have some link with the nuclear industry, so perhaps I'm wrong.

Des appareils pour l'interprétation sont disponibles à la réception. La version française est au poste 2 and the English version is on channel 1.

We would ask that you please identify

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

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

I 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 close of the proceedings.

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

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

President Binder...?

LE PRÉSIDENT : Merci, Marc.

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

Welcome also to those of you joining us via webcast and teleconference.

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

I would like to introduce the Members of the Commission that are with us here today.

So first of all I would like to welcome -- we have three new Commissioners. Two of them are with us here today, starting with Dr. Soliman on my right and Dr. Demeter on my left. And we all know Dr. McEwan. And the third Commissioner is Mr. Rob Seeley, who is not available to participate today but will join us I think in future hearings and proceedings.

We have heard from Marc Leblanc, our Commission Secretary, and we also have with us here today on the podium 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.

Please refer to the revised agenda published on April 10th for the complete list of items to be presented today.

Mr. President...?

CMD 17-M17.A

Adoption of Agenda

THE PRESIDENT: I would now like to call for the adoption of the agenda by the Commission Members,

as outlined in CMD 17-M17.A.

Do we have concurrence?

So for the record, the agenda is adopted.

CMD 17-M18

Approval of Minutes of Commission Meeting

held on March 8, 2017

THE PRESIDENT: Next, I would like to call for the approval of the Minutes of the Commission meeting held on March 8, 2017, as outlined in CMD 17-M18.

I wish to note that we have obtained the approval from Ms Rumina Velshi and Mr. Dan Tolgyesi who were at that particular meeting, particularly on the draft text on the CANDU Safety Issue item, as they were part of the Panel that participated in this meeting.

I understand, Dr. McEwan, you have some observations/comments?

MEMBER McEWAN: Thank you, Mr. President. I have three, if I may.

The first is paragraph 40. In the centre of that paragraph, starting with the sentence, "The Commission appreciates a professional discussion of technical issues." As I read that, I had to read it four

or five times to try and understand the intent of that section and to refer back to the meeting in my notes. I would like to suggest that the intent of that was really three very clear statements that the Commission made. The first is that the Commission believes in scientific evidence and rigour; the second, that it noted the rigour of the evidence that was presented by staff, industry and experts; and that it regards the balance of evidence as supporting no further evidence -- no further action. I think by breaking it down into those three statements it makes it clear that we were presented with a very significant body of evidence supporting no further action. Equally, it establishes that we really do require clear evidence and rigour in that evidence as we make our decisions.

THE PRESIDENT: Any comment on that section?

Sounds good to me. I guess it will be amended. Okay, thank you.

MEMBER McEWAN: Paragraph 43. So in paragraph 43 there is a reference to a 2016, early 2017 third-party peer review of risk-informed decision. Again, it's for clarity. Was this review actually referring to the Luxat and Leeds consulting review that was discussed at

the March meeting? That was actually a separate discussion, but I think that was the reference to the report mentioned in paragraph 43.

MR. FRAPPIER: Gerry Frappier for the record.

Thank you for the question, because we do agree that I think there is a bit of confusion there. Yes, the 2016 and 2017 third party we were talking about is the Leeds and Luxat and is not this subject. In fact, the reference that is being made to the third-party review with respect to the approach to CANDU safety issues was done in 2011 and that was done as part of the *Convention on Nuclear Safety* that we went to Vienna for and had challenges from other countries and particularly we highlighted this approach to the CANDU safety issues. So I think the minutes would be more accurate if instead of 2016 and early 2017 it talked about 2011.

THE PRESIDENT: Now, you really confused us. So was there a third-party review of, I thought, the process of decision-making and if it is, why don't you name the third party?

MR. FRAPPIER: So, yes. I was at this meeting that we're talking about and I probably introduced this confusion. You might remember, Commissioner Velshi

had asked about whether we had had any kind of third-party review around the process that we did, the decision-making or risk-informed decision-making approach that we were taking to the CANDU safety issues and I had responded, yes, we have had that kind of review, but I probably wasn't precise enough. The review I was making reference to was in 2011 where this process was part of our National Report to the *Convention on Nuclear Safety* where other experts from other countries challenge our approaches on different things and in particular the approach we took with respect to the CANDU safety issues, and that was the independent review I was making reference to. It's not so much that we contracted a single individual third party, it was that this was done as part of the process of the *Convention on Nuclear Safety*.

THE PRESIDENT: So I think you need to fix this. And more is better here I think. You can actually add some more context to this, to both the *Convention on Nuclear Safety* and the 2011.

MR. FRAPPIER: Okay. I will certainly work with Secretariat to put a couple of extra lines in there.

MR. LEBLANC: That is correct, we will work and the drafting of the Minutes is really the

Commission reflection of what they feel, so we will seek that precision from staff. Thank you.

THE PRESIDENT: Dr. McEwan...?

MEMBER McEWAN: Thank you very much, Mr. President.

And then the third is paragraph 76, the last sentence, "the Commission recommended that this area of research should be more publicly oriented." I think our intent with our conversation around that was that the outcomes of the research should be more publicly available as appropriate. So if you would agree with that as a change, I would like to suggest it.

THE PRESIDENT: I don't want to put thoughts into your head here, but I thought you wanted to do two things, it's publicly available but also publicly understood. Sometimes we get into the very technical research and you want to explain the outcomes. Is that...?

MR. FRAPPIER: Gerry Frappier for the record.

Yes, I think that was part of it, but I agree with Dr. McEwan that this last line, I think, was really talking about whether we can, you know, be pushing a little bit more to have research properly published, and I think industry had pointed out that a lot of that research

is proprietary and therefore not going to be published, and I think the Commission was indicating, you know, let's try to be biased a little bit more towards making things public than keeping it, you know, out of the public forum.

THE PRESIDENT: So how are you going to fix this?

MR. LEBLANC: Well, again, it's the Commission that will have to fix it and I think that the language that has been suggested by Dr. McEwan, if approved by the Members, would be -- should be more publicly available as appropriate. And I think that will address the Commission's direction in that regard.

THE PRESIDENT: Is everybody happy with this?

Okay. Any other comments on the minutes?

Okay. So for the record the minutes are adopted.

MR. LEBLANC: With appropriate changes. Thank you.

THE PRESIDENT: With appropriate changes. Your legal mind is at work.

The first item on the agenda today is the Status Report on Power Reactors, which is under CMD 17-M19.

I understand that we have representatives

from the nuclear power plants in the room and I am also told that we have a representative on the phone. So let me try to verify if they can hear us.

So let me start, NB Power, can you hear us?

MR. NOUWENS: Yes, we are on the line. Jason Nouwens hear from NB Power.

THE PRESIDENT: Thank you.

OPG Darlington?

MR. KHANSAHEB: Yes. It's Zar Khansaheb, for the record, online.

THE PRESIDENT: Thank you.

OPG Pickering?

MR. GRANT: Yes. For the record, it's Fraser Grant, Director of Operations and Maintenance at Pickering.

THE PRESIDENT: So after the staff present their comments, Bruce Power has a little presentation to make.

So Mr. Frappier, you have the floor.

CMD 17-M19

Oral presentation by CNSC staff

MR. FRAPPIER: Thank you, Mr. President, and good morning Members of the Commission, in particular new Members of the Commission, welcome.

I am here to present Commission Member Document 17-M19, the power reactor status update. My name is Gerry Frappier. I am the Director General of the Directorate of Power Reactor Regulation.

And with me today are the Power Reactor Regulatory Program Division Directors, plus technical support staff who are available to respond to questions on the Status Report on Power Reactors. Also with us, as you have just mentioned, are licensee representatives should there be questions that are more appropriate for them to answer.

As you will note, the CMD was finalized on April 7th. I would like to present a very short update to the report that has occurred since then. It's a simple one, but later on April 7th, on that day, the Point Lepreau planned maintenance outage began. As such, the reactor has been placed in the Guaranteed Shutdown State and the heat transport system is cold and depressurized. The report you

have will indicate that New Brunswick Power is operating at 100 percent, which it was before it went into that planned outage. The work at Point Lepreau is currently anticipated to be completed by April 29th, and that's the only update I would like to bring to the Status Report on Power Reactors.

With that, myself and, as I mentioned, industry are available for any questions.

THE PRESIDENT: Okay. Thank you.

CMD 17-M19.1

Oral presentation by Bruce Power

THE PRESIDENT: So I would now like to turn to Mr. Saunders to talk to CMD 17-M19.1 about Bruce Power.

Go ahead.

MR. SAUNDERS: Good morning. Frank Saunders for the record. We have a presentation.

So on the 26th of March -- I see there is a slight error in your CMD there. It was actually the 26th that this injury occurred, on the Sunday, about two weeks ago. We had an electrical worker working on one of our breakers and made electrical contact with a 13.8 kV electrical system, received burns to his arm and his leg,

was transferred to hospital and then released from hospital about 48 hours later after observation. So I'm going to take you through just what the work was and how the contact was made. We did of course report it to both the MOL and CNSC. The MOL has completed their investigation, at least the onsite portion, and released the site back to us.

So Unit 5 was where this event occurred. It had been shut down for planned maintenance. We had actually had many of these breakers out of service for the previous two weeks and they were isolated and people were working on the individual breakers. The task on this particular Sunday was actually the post-maintenance testing, so the isolations had been removed and we were preparing to put this system back in service. So the work that was underway was just testing the operation of the breaker to make sure that it would function. The system service transformer was supplying the Bus 'Q'. The system service transformer is the one that actually takes the power from the grid and supplies the station, so with the unit down and a maintenance outage of course the power was flying through the system service transformer. The unit service transformer is the alternate route which supplies power from the generator when the unit is running and these breakers can swap back and forth to supply that Bus from

either load, this particular breaker. And, you know, so the breaker was actually out of the cabinet and removed.

So let me just show you the physical setup. So you see here the green line there is moving from the system service transformer over to the -- I think I can do this with the pointer. So this is actually the breaker that the individual was working on right here and we will talk about the status, but this was live, the circuit was live from here to here, so there was no isolation in place. This is actually necessary to do the post-maintenance testing, you need power in the breaker in order to actually do the testing. So this was an intentional situation, it wasn't unintentional.

So this is a picture of the cabinet, this one with the door closed. This one here, the door is open and the breaker is removed. So the breaker is not in this cabinet, it's open. This piece at the back here is known as a shutter. Behind the shutter is the 13.8 kV circuit.

And I have just a short video here for you to show -- and this is how the shutter works and it actually shows you part of the post-maintenance test was actually to do this. This lever operates a shutter. When you put the breaker in, it engages with that lever to open the shutter so the breaker can install. So part of the

test is to make sure that that shutter works okay. So those -- these circles behind here are a live circuit. These top three were energized at the time and the accident occurred on this one.

And just though for completeness, this is the breaker itself. These three connections here are actually fit into those six holes I just showed you, and during the post-maintenance testing the intent is to take this breaker -- I didn't mention something here, so I can't... Down at the bottom here there are rails. This is what the breaker actually slides on. You just basically push it back in there, it engages this lever, opens up the shutters and those six parts that stick out there, contacts slide in here and make contact. So very similar to a breaker in your house except of course it's a much heftier system than you would have in your house and it has more circuits.

So this is the work that the individuals were engaged in. This was a fresh crew, they were just coming in off of days off and the work they were engaged in didn't actually require them to be inside of this cabinet. They shouldn't have been in there, but somehow that did occur. And typically if you were working in the cabinet this lever would be locked out so you couldn't actually

open the shutter, but in this case because we were installing the breaker of course it has to be unlocked so you can do the installation. So this was the nature of the work.

As I say, a root cause is nearly finished. The individual clearly made contact here. You can see the burn marks and stuff on the cabinet afterwards. This accident of course had an extremely high potential for harm, it could have been the ultimate harm. We were indeed and the individual indeed fortunate that this was not much worse.

We have done a number of things here. We are doing a root cause investigation which we expect to finish up this week and we will provide the full incident report which includes both the causes and the fixes to this. We have engaged with industry, including OPG to share this. In fact, OPG has an individual on our root cause team to make sure we spread this information around. We have increased the surveillance from management onto, you know, all activities in the plant, not just electrical work but with a special focus on electrical work until we really fully understand what actually occurred here and why it occurred. And the Independent Oversight Group has also taken an action to observe a number of activities right

from the -- right from the safety analysis on a particular job all the way through to execution to see if we can actually determine anything that helps point the finger at the cause.

Our concern is a little bit broader than -- we normally do a root cause and focus on that. We have broadened it out more this time because I think, if you remember, about a year and a bit ago we had another incident which -- not electrical but also had a high potential for harm. So we are trying to make sure we understand the causes and that there is not some common link here that we are exposed to.

And that concludes the presentation for now.

THE PRESIDENT: Okay. Thank you.

So let's start the question session, and it's open to staff and to anybody online, et cetera. So let me start with Dr. McEwan.

MEMBER McEWAN: Thank you, Mr. President.

Thank you. It helps a lot to see pictures and understand. Thank you.

Pickering Unit 5, the leak and the testing to find the location and the path, this is pretty much what we were told at the last meeting. It's disappointing not

to see a little bit of an update other than just the works going on.

MR. FRAPPIER: Gerry Frappier for the record and I will pass it over to OPG Pickering in a minute.

But as we had mentioned last time when we highlighted this, we will be getting a full report and at that time we will give an update to the Commission. And at this point in time we haven't got that full report from OPG, but perhaps OPG will be able to update you a little bit more. So we will certainly be coming back as we know more. I would say right now we are not confident that we know everything we need to know to come back to the Commission, but perhaps OPG Pickering would like to comment on the situation.

MR. GRANT: Yes. For the record, Fraser Grant, Director of Operations and Maintenance at Pickering.

So in terms of Unit 5, we have done a significant amount of work on this outage. We do believe that we did locate some degradation in some of our sealing areas or areas that are sealed and we have made those repairs. We are currently in progress with repeating the test that originally uncovered these issues and that test is in progress. It runs for another 24 hours, at which

point we will be able to validate the results. That's the end of my update.

MEMBER McEWAN: Thank you. It would have been helpful just to have a little more detail, that work is ongoing and that there is an end in sight.

MR. GRANT: Yes. Fraser Grant for the record.

I understand. We will take that back.

THE PRESIDENT: Anytime I read that you have difficulty locating a leak I get nervous because the whole idea of leak before break concept is subject to be able to detect where the leak is; right? So we spend a lot of time talking about, you know, leak before break but not finding where the leak is. What am I misunderstanding here?

MR. FRAPPIER: Gerry Frappier for the record.

So just to be clear of what leak we are sort of talking about here, this is not a leak in the primary heat transport system, it's not a leak in pressure tubes. So the leak before break we are often talking about here at the Commission has to do with pressure tubes themselves where a leak there would be a very significant item that we would be concerned about.

In this particular case, you have a moderator room where there's equipment that's associated with managing the moderator within the reactor. That room is normally essentially dry, if you like, or there certainly wouldn't normally be very much liquid in there, but there has been some liquid in there, it would seem, because what we did find was in the basement outside in the tunnel which our friends from OPG can perhaps give a bit more detail.

There was some tritiated water that was found, and that water has -- which is still completely within the power plant and unreleased to the environment or anything, but that water has now been traced back to having come from this moderator room, so at some point there was some water that had to be in the moderator room. And it got out of the moderator room through, presumably, these cracks that they're talking about there right now.

So that room is not considered an area of where we would have the primary heat transport system, those sort of concerns that you're indicating there right now.

So that still should not be there, though, and so we want to have that investigated and fixed.

And with that, I'm not sure if OPG wants

to make any additional comments.

MR. GRANT: For the record, Fraser Grant from OPG Pickering.

Just one minor change from Gerry. I agree with what you said; just a minor change in terms of cracks in the floor.

It really is -- these are -- when the floor is built, there are by design construction joints in the floor and what we found is some of the sealing material used in the floor joints was degraded.

I have nothing further to add.

THE PRESIDENT: Thank you.

Dr. Demeter?

MEMBER DEMETER: Thank you for the presentation.

Regarding the electrical injury at Bruce, just a couple questions just of clarification.

Was the worker on contract or an employee? And the second part is, what was their classification or the skill set that they had relative to the task they were performing?

MR. SAUNDERS: So the worker here was what we call a supplemental worker, so he was on contract, but he was being supervised by our staff. So during outages,

we do bring in additional workers and we can do that in a couple ways.

One is they might be supervised by a contractor on a specific job or they may just augment our maintenance crews. And in this case, that was the case. He was augmenting a crew that was supervised by us, and he was a fully-qualified electrician, so he had all the requirements for the job.

MEMBER DEMETER: Thank you.

THE PRESIDENT: Did he actually touch the contact?

I'm trying to understand. He should have known that a high-powered contact -- where did that come from?

MR. SAUNDERS: He had touched the contact or he wouldn't have got the -- he wouldn't have got the shock, yeah. And how that occurred is what we're trying to figure out.

There was an issue -- like I say, all this equipment had been isolated the previous two weeks, so trying to understand -- and this was a new crew coming in and it was a change to the post-maintenance testing from the repair.

So was there a mindset issue, was there

something else? So that the root cause is trying to get to.

Certainly this procedure says you observe from outside the cabinet, and it's a -- you're not supposed to go in because everything is live and we know that. And so this is not a place where you want to be.

But it's never sufficient just to say, "Well, you know, the individual really shouldn't have been in there" because, obviously, there are circumstances that cause that to happen, and so what were they. And so that's what we're trying to understand and sort of make sure they don't happen again.

So you know, in any area where you have a significant potential like you have here, you know, you really just can't afford to make mistakes, so we have to understand how it occurred.

That's what the root cause is about.

Everybody is being very cooperative. There's really no issue here. People are very open about this, so I think we will get to the bottom. But it's sort of brought up this broader issue to us, is there some lack of understanding of risk or a lack of -- or too much comfort around risk or something generally that we ought to worry about aside from this particular event, and that's

why the extra attention is there beyond the root cause, is just looking for the -- looking for that sort of fundamental understanding 'cause yeah, I mean, this kind of voltage scares most people. You wouldn't -- you wouldn't go put your hand on it intentionally, right.

So how does that happen? And it's always an interesting study to try and understand that.

THE PRESIDENT: Thank you.

Dr. Soliman.

MEMBER SOLIMAN: The accident which happened at Bruce, I understand that the root cause is not done yet, but I would like to ask about the condition of the worker right now, if he is still in the hospital or not, and will he return to work. What is the process or the procedure which you are using to get him back to work?

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

Yeah, the worker was released after 48 hours' observation at the hospital. They have a practice with electrical shocks to keep you there for somewhere between 48 and 72 hours because sometimes injuries can be not obvious from the outside. But in this case, they released him.

As far as I know, he's -- I mean,

obviously he has some burns so he's not in prime health, but he -- I don't think he has any serious injuries.

We do get a form back from the hospital eventually which is the driver through the Ontario WSIB to look at the return to work. It's somewhat complicated in this case in that he's a temporary worker, so you know, he -- by the time he's ready to come back to work, that job may or may not be there.

But in the meantime, he's on -- he is compensated through Worker's Compensation, so we're treating it as a lost time injury.

And that, essentially, will go on until he is back in the hiring hall and working as normal.

And there is a process to go through and make that determination, and that's adjudicated by the province through WSIB.

THE PRESIDENT: Any other questions?

MEMBER McEWAN: Sorry. Just one more question for Darlington.

Two incidents occurred in the learning centre within two weeks. There's no environmental issues or issues that would link the two events? They're just unfortunate and probably unrelated?

MR. KHANSAHEB: Yeah. This is Zar

Khansaheb, Director of Ops and Maintenance, for the record.

That is correct. There are no environmental issues. These are unfortunate circumstances, unrelated events.

THE PRESIDENT: So did you ever get root cause here?

MR. KHANSAHEB: Zar Khansaheb again, for the record.

The root cause is these were pre-existing medical issues for both individuals. Both individuals are -- were taken to the hospital and both individuals are now okay again.

THE PRESIDENT: Okay. Thank you.

Did you say both? I thought the description here, the first one, the March 15, was -- just felt ill.

MR. KHANSAHEB: Yes. Zar Khansaheb again, for the record.

The individual felt ill. That individual was also taken to the hospital for review, and no further issues. He's back in healthy condition again.

THE PRESIDENT: Okay. Thank you.

Anything else?

Okay. Thank you very much.

The next item on the agenda is an information item to provide us with an update on the fitness for service safety and control area for the Chalk River Laboratories as outlined in CMD 17-M21.

This was a request the Commission made during the April 6, 2016 public hearing, so following staff comment, I'll turn to the Canadian Nuclear Laboratory for a short presentation.

So I understand that Mr. Mantifel from CNL will make the presentation.

So right now, we also have Mr. Cox on line. Can you hear us?

MR. COX: Yes, I can hear you.

THE PRESIDENT: Thank you.

Ms Tadros, over to you.

CMD 17-M21

Oral presentation by CNSC staff

MS TADROS: Thank you, sir, and good morning. Welcome to the new Commission Members.

For the record, my name is Haidy Tadros. I am the Director-General of the Directorate of Nuclear Cycle and Facilities Regulation.

With me this morning are my colleagues, Mr. Jean LeClair, Director of the Nuclear Laboratories and Research Reactors Division, and to his left, Mr. Nhan Tran, Senior Project Officer of the same division.

We are here to present the seventh status update on the fitness for service, safety and control area of the National Research Universal, NRU, reactor, and Canadian Nuclear Laboratories' progress towards a satisfactory rating.

Since the last update in January of 2017, CNSC staff have confirmed that CNL has achieved a satisfactory rating in the remaining two criteria of the equipment fitness for service specific area, namely, to maintain and replace as required ion chambers and cables for the reactor protection and control systems and the refurbishment of Class 1, 2 and 3 power systems.

With the completion of these activities, CNL has met the criteria provided by CNSC staff for each specific area associated with the fitness for service, safety and control area for the Chalk River Laboratories.

As a result, CNSC staff have changed CNL's overall performance rating in fitness for service SCA to satisfactory.

In conclusion, the action issued by the

Commission to CNSC staff from the April 2016 public hearing has been completed. Therefore, no further status updates on this topic are planned.

CNSC staff will continue to maintain regular compliance oversight at the Chalk River Laboratories, including the NRU reactor.

We are available to take any questions you may have.

THE PRESIDENT: Thank you.

I will turn the floor now to Mr. Mantifel.

MR. MANTIFEL: Good morning. For the record, my name is Neil Mantifel. I'm the General Manager of NRU for CNL, and I believe Dave Cox has some opening comments before the presentation.

MR. COX: Good morning, Dr. Binder and Members of the Commission, including our new members today. For the record, my name is David Cox, and I'm vice-president of Operations and the chief nuclear officer for Canadian Nuclear Laboratories.

As the CNSC Staff have pointed out, we're talking about a fitness for service rating for the overall Chalk River site. Chalk River is a diverse laboratory with a range of Class I and Class II nuclear facilities, radioisotope labs, and other facilities along with a

wide-ranging conventional non-nuclear infrastructure commensurate with a medium-sized town site.

With the exception of the NRU reactors, CNSC Staff had advanced a satisfactory rating for fitness for service going back to the CRL site licence amendment of last year. At that time, a scope of work was defined and agreed to in order to demonstrate that the NRU reactor would reach a satisfactory rating.

However, I'd like to emphasize that the scope of work to achieve a satisfactory rating for the NRU reactor in fact goes back over five years. At that time, upon completion of an integrated safety review of the reactor, over a hundred actions were identified spanning a 10-year time frame, where the first five years of that were front-end loaded in order to achieve many important equipment upgrades.

So as Ms Tadros has mentioned, she now has been regularly appearing in front of the Commission over the last year --

--- Technical difficulties / Problèmes techniques

-- and this is the seventh such update on our progress towards achieving that objective.

So I'm very pleased today to confirm that the actions necessary to support NRU fitness for service

are completed and verified complete. And this represents a very substantial effort on the part of CNL Staff and many contractors. And this achievement involved completion of a large number of substantial equipment upgrades as well as improvements in the delivery of our programs, programs like equipment reliability, system health, obsolescence and aging management. So a tremendous amount of work has been done.

And this leads into we'll soon be celebrating the 60th birthday of the NRU reactor in November of this year, prior to when the reactor will be shut down in a little less than a year from now in March 2018. I want to emphasize that in spite of its age, NRU has been substantially upgraded as described a Class I, II, and III power systems reactor --

--- Technical difficulties / Problèmes techniques

-- control system amongst many, many other operators.

And this work has resulted progressively in significant gains in the mean time between failures experienced while operating the reactor. In fact, a threefold gain in mean time between failures has been achieved over the last few years.

And so today NRU is running, operating safely to support many NRU users, protecting experimental

nuclear fuel, irradiating advanced materials for Canada's power reactors, and for production of industrial and medical isotopes as well as providing neutron beams for a wide range of applications for important health science and industrial applications.

So the staff working at NRU are very proud of this accomplishment and I share in that sentiment.

And I now turn it over to Mr. Mantifel, general manager of the NRU reactor, to walk us through a short presentation on the last phase of completing this important work.

MR. MANTIFEL: Good morning. Neil Mantifel for the record.

Thank you for the opportunity to give a brief additional information on the equipment fitness for service activities carried out in NRU.

In the opening photographs, these two photos are of the main electrical distribution room in NRU. And the difference between the photos is the new inverter replacing one of the motor generator sets that converts direct current to alternating current to support the safe operation of the facility has been installed.

The equipment fitness for service required significant effort, as Mr. Cox had mentioned. We had a

dedicated team for the last five years working on the NRU integrated implementation plan. And refurbishment of the power systems was definitely the largest and one of the final elements to receive a satisfactory rating in addition to the ion chambers.

The equipment fitness for service area included four high-priority equipment areas and program groups. And each one of these four areas had multiple items attached to them. The first area is replacement of ion chambers and cables. The second is refurbishment of Class I, II, and III power systems. These are the two items that today we have a satisfactory rating on. And the third item is replacement of the rod monitoring system. This item was declared satisfactory last January. And item four, the establishment of systematic equipment reliability programs, the system health programs, was declared satisfactory last December 2016.

The first element of equipment fitness for service is ion chambers and cables. In the photo we see one of the ion chambers being uncrated with its chamber and shielding plug and cables being prepared. To date all 11 ion chambers that were committed to be replaced have been replaced. We have preventive maintenance procedures in place, allowing us to analyze and report the system health

of all the ion chambers. And we have testing as completed and calibration of all the spare ion chambers, the 11 spares. So they are ready for installation if required, and they're in our spare parts inventory and maintained there.

The item two, element two is the refurbishment of the Class I, II, and III power systems. In the photos you see a new rectifier unit beside one of the old DC motor generator sets, a new inverter A, and a new diesel generator.

So this activity, some of the sub-elements were replacement of inverters Alpha, Bravo, and Charlie, including the three Class I panels that they connect with.

We replaced the emergency power system, battery bank no. 1, at the beginning of the integration implementation plan.

We also replaced the two Class I rectifiers and we replaced all 23 Class I breakers with retrofit kits in their existing panels.

We replaced the Class II breakers and a new panel. There were seven Class II breakers, and we replaced all 21 Class III breakers, again with retrofit kits in their existing panels.

We also replaced our two rotating pieces

of equipment, two motor generator sets. It's a DC motor that runs a generator with inverters Delta and Echo.

And we procured three spare Class III NRU loop diesel generators. We also have installed one of the new diesel generators, and it is in its final commissioning and testing is in progress. We anticipate it to be in service in July.

The refurbishment of the rod monitoring system, element three. The scope of this project was optimized to reverse-engineer the instruments that are contained in the panel. And we produced a fleet of spares for the existing thermovolts and transcope instruments.

You can see in the photos the old transcope used a paper roll and ink pens to record the rod flows on the individual fuel rod positions. The new system is again similarly colour-coded, but is analogue gauges but digitally recorded on our reactor monitoring system.

And the old thermovolts were replaced with a new solid-state device to get rid of the tubes and gears and mechanical mechanisms in the old device.

So we have now 25 thermovolt units delivered to CNL and in inventory, and 10 transcope units also shipped to CNL and in inventory. The reason there's only 10 transcopes is because each one monitors three

thermovolt positions, three fuel rod positions.

And the final, the fourth area of equipment fitness for service was implementing a systematic equipment reliability program. So this was declared satisfactory in December. And we now have routine monitoring of all 46 safety-related systems and the 39 balance of plant systems use a graded approach to monitor the system health on an ongoing basis.

And the plot that you see is -- starts back in 2011 when we started the program. We had a low in 2012 of a mean time between failure of around 174 hours between trips or forced shutdowns. And with the implementation of the integrated implementation plan and these equipment reliability and fitness for service activities, we're now on a continuous trend and about 554 hours between either a trip or a forced shutdown.

And in summary, just again this has been a significant effort for a large number of people over the last five years. We have increased our mean time between failures significantly. We operated 230 planned days last fiscal year, which is high for a research reactor. And the equipment reliability and fitness for service are key enablers to support the safe and reliable operation of our soon-to-be 60-year-old research reactor.

So we're proud to have achieved the satisfactory rating and for both NRU and the Chalk River site. And now we'd be willing to take any questions that the Commission may have.

THE PRESIDENT: Thank you. So let's jump right into the question session with Dr. McEwan.

MEMBER McEWAN: Thank you, Mr. President.

So I guess I would like to congratulate Ms Tadros and Mr. LeClair and your team for shepherding this and for making each of the seven presentations so clear and so structured and easy to follow. So thank you. And I guess just, you know, congratulations on finally achieving it.

The 565-hour mean time period: is that now sustainable for the balance of the life, or are you expecting fluctuations and variations?

MR. MANTIFEL: We suspect it's sustainable and I suspect it will also continue to improve. Neil Mantifel, for the record.

The trend is increasing. The majority of the IIP work has been completed and now we're enjoying the benefit of that obsolete equipment being replaced and refurbished with modern more reliable equipment.

MEMBER McEWAN: So the replacement period,

would it have been easy to make these replacements say eight years ago or is there a temporal relationship to being able to do it now?

MR. MANTIFEL: Neil Mantifel, for the record.

These replacements were part of the Integrated Safety Review and the integrated implementation plan. It was a prerequisite for our previous licence, a five-year licence. So that required a significant amount of funding, a significant amount of design time, procurement time, installation and commissioning time.

If an Integrated Safety Review had been done earlier, I suspect it could have been done earlier, but it does take time to make these changes in the field while the reactor continues to operate to deliver on its mission. So it could have been done earlier if the desire was there, but...

MEMBER McEWAN: So I guess that leads to, in the absence of the Integrated Safety Review, would these issues have been identified?

MR. COX: David Cox, for the record.

NRU has been subject to a number of reviews over the years, and I note that in the late-1990s and in the period leading up to about 2005 there were seven

substantial safety upgrades that were implemented for the reactor, which improved the overall safety of the plant relative to its original design. So that was the initial series of important and other beneficial safety upgrades.

The Integrated Safety Review that Mr. Mantifel has mentioned was a follow-on to that and was the next level driven by international standards around completion of Integrated Safety Reviews, and so was a logical extension of the earlier upgrades, the seven upgrades in the late-1990s to early-2000s.

MR. LeCLAIR: Jean LeClair, Director, Nuclear Laboratories and Research Reactors Division.

Perhaps to compliment what was just said, is the Compliance Verification Program of course reviews a number of things through desktop reviews and inspections. What led to in fact the Integrated Safety Review was a continuing verification that eventually led from the reduction of the rating from a satisfactory to a below expectation, so these things had progressed.

Through CNSC Staff reviews, evidence that was suggesting that fitness for service was an issue led to the eventual conclusion by Staff that fitness for service went from a satisfactory rating to below expectation. That rating, below expectation, then led to the Integrated

Safety Review, which is the appropriate way to deal with a series of non-compliances, is to review the entire program and approach it in an integrated way.

So then once the program is in place, which was the IIP, which included a number of things, not just fitness for service, but several other items; CNSC Staff can then verify and continuously verify for improvement. Then we then see over the last year where we were finally into the final stages, after a series of improvements, to be able to identify the closure criteria that were then presented to the Commission, which we've now systematically verified and progressed towards closure.

So Integrated Safety Review I would say is an outcome of compliance verification that eventually leads to a situation that we determine needs much more bolder, stronger actions to bring the licence back into full compliance.

MEMBER McEWAN: Thank you.

THE PRESIDENT: Dr. Soliman?

MEMBER SOLIMAN: Thank you, Mr. President.

What is the rod monitoring system and what are you monitoring exactly here? Is there any relation between that system and the curve given on the second page?

MR. MANTIFEL: Neil Mantifel, for the

record.

The rod monitoring system, the design of NRU, each individual fuel position has individual monitoring on flow, pressure and temperature. So the rod monitoring system is a system that collects the data on each individual fuel rod: its coolant flow; its pressure; and, its temperature.

So that is all data logged for each rod now, rather than chart recorded as previously. It has also trip on low flow of any single rod position. It has a trip capability.

As far as a connection between the plot on mean time between failure and the rod monitoring system, the rod monitoring system was more of a maintenance issue, it did not contribute significantly to our forced shutdowns or reactor trips. It was a maintenance intensive equipment, and we were basically in an obsolescence state where new parts could no longer be procured to maintain the old equipment. So monitoring equipment was reverse engineered that has good spare parts capability.

MEMBER SOLIMAN: Thank you.

THE PRESIDENT: Dr. Demeter?

MEMBER DEMETER: Just to help me understand the histogram from the Staff report on the last

page. I take it the green bar at the very top, which indicates the number of overdue jobs, being at 75, is sort of your marker, and that there's now remaining about 20 overdue jobs of March 2017.

I suspect that some jobs have -- not all jobs are equal. Is there a mechanism that, even though there's only 20 remaining, that you look at the priority of these jobs such that even though there's only 20 left some, you know, might have a higher priority even though it's below your green bar?

So just confirm for me what the green bar is and a prioritization system for remaining jobs.

MR. LeCLAIR: Jean LeClair, for the record.

First, I'll begin by saying 75 was a number that was selected by the licensee that we had reviewed. I'll bring you back, because as a new Commission Member, actually this was a question that was previously asked, but I'll share that with you and it'll be a reminder for perhaps Dr. McEwan and Dr. Binder.

But with regards to the program, in fact when we came to come forward with the Commission to inform them that we had now determined that this area was addressed, which went back now I guess about four months,

four or five months, we actually went through and looked at the overdue items to in fact verify and assure ourselves that those overdue items, because it's quite clear that there's several items that need to be done. We're not surprised that not everything gets done immediately, and so it's not unusual there are going to be overdue items.

That being said, we want to make sure though that the ones that are overdue are not safety significant items. So back when we had made a determination this could be rated satisfactory: 1) we made sure that the numbers were reasonable; but, 2) that the ones that are actually remaining are not safety-significant items, so there are no overdue items that are presenting an unacceptable risk.

MEMBER DEMETER: Thank you.

THE PRESIDENT: Just so you know, this is one of my very favourite SPIs for everything; a backlog of maintenance should be a good indication that something -- there's got to be kind of an acceptable level of overdue. But when it gets into 80-90 on a facility, it should be a real indicator for us that something needs to be looked at. Not only NRU, I'm talking about all facilities.

Any other questions? So, first of all, let me congratulate the NRU on its 60 years. It's very ironic

that it's going to be in the best shape of its life in the last few months of its life. You know, you invested to bring it up to satisfactory from a regulatory perspective, just to terminate it in March 2018.

There's a lesson here I think on both the regulator and the operator about why would you refurbish at the last minute rather than do it years before, which we already got an answer to.

But I've got a specific question. With all the equipment, the new equipment that you're going to put -- that you just put in, are you going to salvage anything post-2018?

MR. COX: David Cox, for the record.

We will look at salvageability and reuse of equipment from NRU in the post-shutdown period, and we have plans for that; manage through the post-operating period and transfer the facility into a safe shutdown, and then eventually storage with surveillance state.

To comment on the upgrades and the timing of the upgrades, we view it as, you know, it's always important to continually improve our reliability and of course our ability to meet all safety requirements. The upgrades that have been accomplished, although many of them have been recently put in place, a large number of them

have come into fruition over the last five-year period and they all contribute to our ability to better meet the R&D mission.

With the precious remaining life of NRU we're trying to extract and squeeze out and maximize all of the R&D benefits for the CANDU industry from the important facility. So all the safety improvements prove our ability to achieve that objective.

THE PRESIDENT: Okay. Thank you. Anything else on this?

Thank you very much. I'd like to move on to the next item on the agenda, which is initial report on exceedance of regulatory dose limits by a nuclear energy worker during a therapeutic nuclear medicine procedure at the Vancouver General Hospital in Vancouver, British Columbia, as outlined in CMD 17-M22.

I understand that we have representatives from the Vancouver Coastal Health Authority joining us by teleconference from different locations in Vancouver, to be available for questions. So let me just test technology.

Anybody on line? I understand that Ms Gonzalez is representing the hospital. Can you hear us?

MS GONZALEZ: Yes, we can.

THE PRESIDENT: Anybody else that want to

pipe in?

MS HOLLERBAUM: Hi. It's Rhonda Hollerbaum.

THE PRESIDENT: Okay, thank you. So first --

MR. ENNS: We currently have five representatives on the line for Vancouver Coastal Health.

THE PRESIDENT: Okay, thank you very much. So I'll turn to Mr. Moses for the staff presentation.

CMD 17-M22

Oral presentation by CNSC staff

MR. MOSES: Thank you, and good morning, Mr. President, Members of the Commission and welcome to the new Commission Members.

My name is Colin Moses and I am the Director General of Nuclear Substance Regulation.

With me here today are Mr. Peter Fundarek, Director of the Nuclear Substances and Radiation Devices Licensing Division as well as Caroline Purvis, Director of the Radiation Protection Division and Ms Adelene Gaw, Dosimetry Specialist in the Radiation and Health Sciences Division.

Mr. Fundarek will provide an overview of this event initial report.

MR. FUNDAREK: Thank you. Peter Fundarek for the record.

The event initial report being presented today concerns an extremity exposure to a worker at the Vancouver Coastal Health Authority. Commission Members may recall that an EIR was presented in December 2016 for this same licensee, in that case as a result of the handling of Yttrium-90. In the event before the Commission today the exceedance of the regulatory limits was attributed to a different nuclear medicine technologist at a different hospital, the Vancouver General Hospital.

On March 3, 2017 CNSC staff was notified of the potential overexposure of a nuclear energy worker at the Vancouver General Hospital as a result of the use of Iodine-131 and its contamination. Iodine-131 is used in therapeutic nuclear medicine to treat disease of the thyroid gland. Because iodine is preferentially absorbed by the thyroid gland, it is orally administered to a patient in liquid or capsule form to oblate any remaining thyroid tissue.

The licensee's full report to the CNSC on this event was submitted on March 24th and describes the

circumstances leading to the contamination as well as the licensee's proposed corrective actions.

According to the licensee's report, on the afternoon of March 1st, 2017, a nuclear medicine technologist who is designated as a nuclear energy worker, was administering therapeutic doses of Iodine-131 to two patients. The patients used a straw to orally consume the iodine solution and the two patients were each separately given instructions on how to ingest the liquid, including not removing the straw from the container after the liquid was consumed.

The first patient, however, removed the straw from the container after consuming the liquid. It is suspected that some small imperceptible droplets were made airborne and deposited on the transfer cart, including the handle, which was identified as the potential source of the contamination.

Although the medicine technologist wore gloves during the administration of the Iodine-131, the technologist removed her gloves when transferring the cart back to the nuclear medicine preparation area where the technologist then donned gloves to dispose of the therapy items and washed her hands at the conclusion of this work, approximately 15 to 20 minutes following the completion of

the Iodine-131 administration. The technologist did not monitor her hands once complete, nor did she monitor at the end of her work shift as required by licensee procedures.

The following day, March 2nd, the same technologist was involved in diagnostic nuclear medicine procedures with Technetium-99m and again failed to monitor her hands following this work.

On March 3rd the technologist prepared Yttrium-90 doses for therapeutic procedures. Following completion of this work the technologist monitored her hands and discovered the Iodine-131 contamination. The technologist began repeated washing of her hands and cleaning with other substances. The technologist was removed from any further work involving the direct handling of radioactive materials. The right hand was found to have the highest levels of contamination while the left hand had lesser amounts of contamination.

Following the cleaning when subsequent washings were not further reducing the levels, the technologist was advised to continue to wear gloves with the expectation that the remaining iodine would be removed by sweat production and natural decay.

Since there was a potential for inadvertent contamination of objects or locations within or

external to the hospital, the licensee conducted contamination monitoring of objects in areas likely to be affected. Contamination was found on the transfer cart, particularly on the handle. Contamination was not found on any other hospital object in the nuclear medicine area or on any other staff members.

The technologist's car and home were checked and contamination was found on a cellphone case and the gear shift lever of her personal vehicle. The case was removed from service and the gear shift has been covered while the isotope decays. There is no evidence that any other member of the public received an exposure as a result of this event.

The licensee calculated a maximum exposure of 114 mSv to the ventral surface of the left hand and 2327 mSv to the ventral skin of the right hand, significantly higher than the regulatory limit of 500 mSv per year. CNSC staff reviewed the dose assessment and is in agreement with the estimate.

The technologist has not experienced any effects as a result of the exposure and has been assessed by a nuclear medicine physician. Monitoring of the technologist by the licensee will continue until at least September 2017, six months following the incident.

As noted, the technologist has been removed from any work with radioactive materials and has received retraining on contamination control procedures. A plan for the technologist to return to work with radioactive materials was submitted by the licensee to the CNSC and approved by the CNSC staff on March 17th.

The licensee had already been involved in strengthening their internal procedures for contamination control as a result of the previous Yttrium-90 contamination event and has developed stronger standard operating practices for the handling of nuclear substances which include:

- A memo was sent on March 3rd to all staff of the Vancouver General Hospital regarding the importance of adhering to monitoring practices for therapy administrations and posted in all other hospitals for this licensee by April 1st;

- A revision to the Iodine-131 therapy records to include the documentation of staff and equipment monitoring post-therapy;

- Mandatory documentation of daily hand monitoring for all nuclear medicine staff at all hospitals including prior to breaks and to leaving for the day;

- Mandatory double-gloving for all a

therapies involving Iodine-131, Yttrium-90 and Radium-223;

- There was a teleconference with all site radiation safety officers using Iodine-131 or Yttrium-90 in liquid form to discuss safe handling practices and the implementation of these new mandatory practices;

- They had development of a two-day radiation safety officer refresher training course that is going to be delivered this month. This had already been planned prior to the Yttrium-90 event;

- And they will incorporate retraining for all staff involved in Iodine-131 therapies by May 24th.

The licensee expects that all site RSOs have implemented the new procedures as of April 1st. The initial monthly results of the mandatory contamination monitoring will be discussed by the licensee at the radiation safety committee meeting on May 25th.

CNSC staff has reviewed and accepted the investigation report submitted by the licensee but remains concerned that two similar events happened under the same licensee in such close proximity.

CNSC staff will continue to monitor the licensee's response to ensure that the proposed licensee actions are properly implemented and will be effective in preventing future occurrences.

CNSC staff has planned a Type 1 audit of this licensee to be carried out this fiscal year.

In addition CNSC staff has prepared an article on the importance of contamination monitoring that will be included in the next edition of the DNSR newsletter that is sent to all licensees.

CNSC staff remains available for any questions that the Members may have. Thank you.

THE PRESIDENT: Thank you.

Before getting to the question period I would like to ask whether anybody from Vancouver Coastal Health Authority like to make comments. I understand Ms Gonzalez is going to be the spokesperson.

MS GONZALEZ: That's right. That's correct. Thank you, so Marjorie Gonzalez, for the record.

Thank you to Mr. Fundarek for the summary of the incident.

We would like to state that increased safety practices such as double-gloving and more frequent monitoring for Y-90 therapies were fully implemented for those therapies after the first contamination incident. However, implementation of increased monitoring and contamination control practices for other therapies at all of our hospitals was a work in progress at the time of this

new contamination incident.

In light of this incident the implementation of these practices was fast tracked and started at the beginning of the month.

In addition, monitoring of equipment associated with therapies was not something we had implemented but we learned from this incident that is necessary and has been enforced for all therapies.

Finally, we would like to stress that daily hand monitoring is an integral part of our radiation safety program and is included in our protocols. We expect that all of our technologists to comply with this practice. During the first incident involving Y-90 the technologist did not monitor between patients but she did monitor at the end of the day as expected, which was not the case for this new incident. We are now enforcing daily monitoring for all technologists and documented that it has been performed.

So we are available for further questions you may have about these incidents. Thank you.

THE PRESIDENT: Thank you. So let me start with Dr. McEwan.

MEMBER McEWAN: Thank you, Mr. President.

There are so many things wrong with this

story that it really does make me question how effective the radiation safety organization within this health system is. And I am also surprised there is no nuclear medicine physician on this call. I'm disappointed in that.

So I think, to start with, I would like to understand how your radiation structure -- radiation safety structure in the Vancouver Coastal Health Authority is structured, how it works and what your broad operating parameters and SOPs are, please.

MS GONZALEZ: Thank you. Yes, we have the medical imaging, Medical Imaging Department; we have myself as the Regional Radiation Safety Officer and as a Medical Physicist as well; we have a Regional Practice Lead for Nuclear Medicine who supports radiation safety initiatives; then we have Site Radiation Safety Officers at each of our departments. And this is all overseen by various management and director level members. And we also have contributions from Workplace Health Departments here in the Coastal Health Authority.

MR. ENNS: And as part of the ongoing maintenance of this program, all of these committee members, that would be the Regional RSOs, the Regional Practice Lead and all of the site RSOs as well as Workplace Health convene every two months for a full day of radiation

safety and professional practice meetings.

MR. LEBLANC: So just for the record, that was Mr. Kevin Enns I believe.

MR. ENNS: Yes.

MR. LEBLANC: And please identify yourself for the record. Thank you.

MR. ENNS: Pardon me. Yes, Kevin Enns and I am the Regional Manager for Quality and Process Improvement within Medical Imaging and Nuclear Medicine here.

MEMBER McEWAN: So who -- can you give me the membership of your Regional Radiation Safety Committee, the exact membership, please?

MS GONZALEZ: The members are 12 -- 10 Site Radiation Safety Officers, myself as the Regional RSO and Medical Physicist. There is one Regional Practice Lead, there are four representatives from Workplace Health, there is one management representative and one director management representative.

MEMBER McEWAN: So you have no physicians on it?

MS GONZALEZ: Oh, yes, sorry. And one physician, yes.

MEMBER McEWAN: And you are CCPM?

MS GONZALEZ: Yes, I am. Yes.

MEMBER McEWAN: So this is a very large committee that is managing how many different hospitals and facilities?

MS GONZALEZ: We have 12 hospitals in total and about over 100 nuclear medicine technologists.

MEMBER McEWAN: Okay. So you are only dealing with nuclear medicine, you are not dealing with radiation oncology?

MS GONZALEZ: No. No. We are just nuclear medicine.

MEMBER McEWAN: Okay. So this brings me back to a concern that I have expressed, in fact the Commission has expressed several times, and that is that these large regionalized hospital authorities have really not a great deal of guidance in terms of what we as a Commission would expect in terms of structure, people reporting and operating parameters. The membership that I'm looking at this just seems wrong for managing 12 different hospitals and clearly the fact that you have had two -- that there have been two failures of radiation safety processes indicates that the system is not working.

So I guess a question for Mr. Moses. You committed to us that you would come back to us with a

review and give us an opportunity to have a broad discussion of what is required in terms of radiation safety. Could you tell us where that is, please?

MR. MOSES: Colin Moses for the record.

Yes. There are really two prongs to our oversight.

The first is increased use of Type 1 inspections which will take a more programmatic and holistic review of the programs. And as mentioned in the Event Initial Report we do have one planned for early 2018 of this particular licensee. The Type 1 inspections are particularly useful because they do look at the effectiveness of the program and the implementation of the program rather than looking at the compliance with the procedures and regulatory requirements that we do as regular Type 2 inspections.

The second prong, we would like to look at the overall effectiveness of the RSO function and the structures that are needed to support the RSO function and so we are launching an evaluation which will include a survey of all RSOs and their functions, with a particular focus on the medical community in order to gauge the structures that they have and the effectiveness of those structures to support them in their functions. So that

evaluation will be conducted over this fiscal year and will inform future updates to our regulatory expectations, in particular looking at whether there's a need to be more explicit in our regulatory requirements as to the specific criteria needed to demonstrate their competencies.

MEMBER McEWAN: Okay. Would you mind if I expressed deep unhappiness with that answer. We asked for some response back to the Commission this year. There is clearly an issue in the governance of these large organizations. We are now seeing the effects of those issues of governance and what you have described suggests that we may get something from you in 2018. That's too late and I would like a commitment from you that we get something much, much earlier than that.

MR. MOSES: Colin Moses for the record.

Thank you for that. And yes, you are correct, we have committed to return to the Commission in the context of a regulatory oversight report in September with the very specifics on that. I will turn it to Mr. Fundarek, who is leading the review.

MEMBER McEWAN: I'm going to interrupt you. My memory is that you committed to come before the ROR.

MR. MOSES: Colin Moses for the record.

I can appreciate that and we can review the transcripts and the minutes to look and ensure we meet that expectation. But I will turn it over to Mr. Fundarek who can give some specifics on where we are in our review.

MR. FUNDAREK: Peter Fundarek for the record.

CNSC staff started immediately after the previous ROR report to look at issues and how to manage the RSO functions at large organizations, particularly the medical. We have picked the medical institutions to start with. They are a motivated group and they are generally well trained, so that was a good place to start.

We have engaged our Internal Audit and Evaluation Group to help us determine the best approach for evaluating the ways that RSOs work. We are looking to see what are the factors that contribute to the success of an RSO to make sure that they can do their job and we are going to see if there is a commonality there that we can then leverage and implement for all RSO programs to make sure that they are effective, recognizing of course the specific situations that exist with these large regional hospitals. We are seeing a shift by the provincial authorities to move to larger regional authorities of this type. The CNSC has no jurisdiction to dictate otherwise,

but we are monitoring the situation and when situations like this arise we obviously understand that there is a significant issue that has to be addressed immediately.

But the Radiation Safety Officer Survey will be carried out to evaluate what are those factors that contribute to an RSO's success so that we can identify them and use them as the model for anything going forward. We want to conduct any kind of a survey or any actions following the survey based on an evidenced-based approach so that we have some real data to demonstrate where the problems exist, if any, and what measures can be taken to effectively address those issues.

MEMBER McEWAN: So has G-121 been incorporated in the current REGDOC or is still that the guidance that is available for Radiation Safety Committees?

MR. FUNDAREK: Peter Fundarek for the record.

My understanding is that G-121 on the functioning of radiation safety committees is being incorporated into another regulatory document as part of a larger overall evaluation of the radiation protection documents, including things like G-129 on keeping doses ALARA and GD-52 on design of nuclear medicine and laboratories involving nuclear substances. So there are a

number of radiation protection documents that are currently outside of the REGDOC program that will be incorporated into REGDOCs following revision.

MEMBER McEWAN: So 121 will be the current guidance?

MR. FUNDAREK: Peter Fundarek for the record.

At this time, yes, 121 remains as the current guidance.

MEMBER McEWAN: So is the makeup of this Radiation Safety Committee compliant with G-121?

MR. FUNDAREK: Peter Fundarek for the record.

G-121 is a guidance document and so therefore it doesn't have any mandatory requirements in it. We look for the functioning of the committee as a whole in terms of our evaluation of the licensing program, but we can't mandate specific members of the committee through G-121 as it is only a guidance document.

THE PRESIDENT: Okay. You mentioned a couple of times mandate, et cetera. Please, as I keep saying to everybody, we have lawyers, they will tell you what you can and cannot do, don't jump to tell us what you can. We license a licensee. We have lots of -- let me put

it this way -- influence about structure and performance, so I'm not buying the idea that we cannot be very strong. And if we don't like the original model, we should start coming out publicly ASAP that we don't like that model, we don't believe it's effective, and let the provinces and let all the hospitals react to that. I'm just not buying that we have to spend another two years to determine what is the governance model that will be acceptable to us. So I'm just trying to bring this to a bottom line. So we would like to see an early stance from staff about what is acceptable.

MR. MOSES: Colin Moses for the record.

Duly noted and we will certainly look at doing that.

MS GONZALEZ: Marjorie Gonzalez for the record. Can I make a comment as well?

THE PRESIDENT: Please go ahead.

MS GONZALEZ: When you are evaluating the functions of RSOs and trying to determine what would make a successful RSO, it would also be very helpful for us to have some sort of guideline on the number of RSOs that, you know, we should be aiming to have depending on the size of the organization, the number of patients. We see the number of therapies that are treated. Having guidelines on

those kinds of numbers would be very helpful as well.

THE PRESIDENT: I consider it to be part of the governance model because some of those hospitals are huge and they may require a different structure to make sure that they are effective.

Dr. Soliman...? No.

Dr. Demeter...?

MEMBER DEMETER: Thank you.

I'm going to -- we talked a lot about systemic issues, I'm going to get more into the weeds here. So I think when I read this CMD, and I also read the former one, the 16-M72 on the yttrium issue, it raises two concerns: one that this is literally I think within six months two fixed contamination to the skin and this one in particular exceeded thresholds for possible tissue reaction that we normally quote at 2 mSv for skin damage. So it's a significant and a serious fixed contamination.

So what I want to know is do we have a sense on historic extremity dose trends for this institution or this licensee? And for this particular individual I didn't hear if there was any issues with the thyroid monitoring and since they contaminated personal objects is there anyone else in their household that we need to do thyroid monitoring on relative to potential

contamination? So we will start with sort of the historic extremity dose and if this individual has an issue and what the thyroid monitoring results were given the amount of fixed contamination and that they did transfer it?

MS GONZALEZ: Marjorie Gonzalez for the record. I can go and take that.

The historic extremity records for all of our workers in general have been very low. The annual doses from ring dosimeters are about 70 to 80 mSv per year. In general those would be the maximum doses. Most of our doses are below that. Thyroid monitoring for this individual was conducted and it was below the 1 kBq threshold. The highest value that was obtained for her was .73. And we did monitor every -- for contamination we did monitor all other workers in the Nuclear Medicine Department and no one else was found to be contaminated. Family members, we did monitor her house as well and there was no fixed contamination anywhere in her house other than in her personal vehicle.

MEMBER DEMETER: Okay, thank you. That sort of gives me some of the details. I would strongly suggest that given that this was the second incident within a short period of time and reaching a critical dose that waiting until September 2017 for a more systematic review

may be pushing the limits for timelines for reaction. The number of times I hear about threshold doses in nuclear medicine workers, I don't think I have had that kind of experience in my tenure as a nuclear medicine physician. When you hit over 2 mSv as an extremity dose, that's serious and I think it should cause a bigger concern given the systematic issues that have been raised and the second incident and a threshold dose. So I think early 2018 for the sort of broader inspection is probably too late.

MR. MOSES: Colin Moses for the record.

Thank you for that feedback. I certainly don't disagree. It was extremely concerning to us as a regulator to see a second incident in such close proximity which does cause us to question the implementation of the Radiation Safety Program as well as the safety culture of the licensee.

With respect to the timing delays of the inspection, it was a previously planned inspection. We did look at potentially advancing that. From our perspective there is a lot of attention being focused on that, there are a number of corrective actions which we will be closely monitoring, and so the idea behind the timing of that inspection is to assess whether those improvements have truly taken root in the program and in the practices of the

workers and therefore we wanted to allow some time to elapse before we did do that more comprehensive assessment of the program.

But I do take your feedback and certainly we will be monitoring the implementation of this licensee and look at potentially advancing that.

MS GONZALEZ: Marjorie Gonzalez for the record as well.

We have changed our protocols to include more strong monitoring practices for all these therapies and for regular work as well, including diagnostic procedures as well. Those are all part of our therapies and we will be auditing those new processes as well.

MEMBER DEMETER: My concern is that you might not know what the actual problem is until you do that sophisticated more comprehensive audit, so a lot of these fixes in the interim may fix little bits along the way, but there has to be a big picture look at what the problem is because you won't know that until you actually maybe do that that Type 1 audit.

THE PRESIDENT: But I still think, if I understand correctly, there are two different things. One is an audit of this particular licensee to see what they have done as a result of these events. The other thing

that we kind of very aggressively want to see is more of a governance model, not only for that facility but all facilities, that they have those complexities built in. Provinces structure how many hours, so where are they, they should be on site supervising, they cannot -- I don't believe they can be super -- I'm showing my bias, I don't believe they can be supervised from a central headquarters without having RSOs on site. The question is how many, what level of expertise, et cetera, et cetera. All those things are independent of this particular incident. It's kind of more of a policy review of what it is that we would like to see as the effective model. Did I get it? Are we on the same page on what needs to be done?

MR. MOSES: Colin Moses for the record. Absolutely. And certainly, to reiterate your point, it's insufficient to have a single RSO sitting at a remote location overseeing a program across multiple licensees -- locations, and that is why we do expect that each location has a site RSO onsite and available to oversee the implementation of the program in those particular facilities. But as you noted, the reason we did launch this review of the RSOs is to review the elements that are necessary to ensure that they can effectively perform those duties regardless of the governance

structure, regardless of the program structure behind them.

THE PRESIDENT: Okay.

Dr. McEwan...?

MEMBER McEWAN: So a couple of questions on that.

I think one of the issues is the definition of an RSO onsite and I think we are very unclear on that in our expectations. Training, more importantly span of responsibilities and span of authority, and I think we need to be much, much more prescriptive in how we define that in these large organizations.

Secondly, Dr. Demeter asked a question about thyroid activity and thyroid dose. Was that able to be calculated in this individual?

Thirdly, for Vancouver Health, who chairs your Radiation Safety Committee?

And finally, Mr. Moses, I was wrong, Mr. Leblanc has told me that we did agree to the ROR in September, so I apologize.

MS GONZALEZ: Marjorie Gonzalez for the record.

For the thyroid monitoring for this worker, the uptake was below the 1 kBq threshold, so there was no high uptake for her in this case.

And I'm sorry, can you repeat the other question?

MEMBER McEWAN: Who chairs your Radiation Safety Committee?

MS GONZALEZ: That is shared between myself and our Regional Practice Lead for Nuclear Medicine.

MEMBER McEWAN: That would be unusual to have an RSO chair a committee. Isn't the RSO normally the servant of the committee?

MR. ENNS: Kevin Enns for the record.

We have had those discussions with Workplace Health as far as who should be chairing the committee. At this time it is a joint venture in participation, but right now we have our RSO and Regional Practice Lead as the chair, with Workplace Health as active participants and resources.

MEMBER McEWAN: So I guess again, what is Workplace Health's knowledge of radiation safety and radiation safety practices?

MS GONZALEZ: Marjorie Gonzalez for the record.

We do have requirements for Workplace Health to provide us with a Radiation Safety Advisor, someone who is knowledgeable in radiation safety matters

and who is familiar with our protocols and practices. That is an internal requirement for us.

THE PRESIDENT: Well, we are not going to resolve it here, but it does indicate that there is a disagreement -- not disagreement, but a misunderstanding of what the right structure should be and I just want to convince the various authorities to follow up on this. So again, it should be part of your observation. Both of the specifics of the Vancouver and the general study about the model structure we would like to see. Okay?

Okay, thank you. Thank you very much. This concludes the public portion of the meeting of the Commission. The Commission will now move into -- whoops, how are we going to do this? Are we going to take a break? Because we are running out of time.

MR. LEBLANC: Yes. So we apologize for those who are here for the 11 o'clock hearing. The hearing will start at 11:30, after a break. Thank you.

--- Whereupon the meeting adjourned at 11:10 a.m. /

La réunion est ajournée à 11 h 10