

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public meeting

Réunion publique

November 7th, 2019

Le 7 novembre 2019

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

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

Commission Members present

Commissaires présents

**Ms Rumina Velshi
Dr. Sandor Demeter
Dr. Timothy Berube
Dr. Marcel Lacroix
Dr. Stephen McKinnon**

**M^{me} Rumina Velshi
D^r Sandor Demeter
M. Timothy Berube
M. Marcel Lacroix
M. Stephen McKinnon**

Secretary:

Secrétaire:

Mr. Marc Leblanc

M^e Marc Leblanc

Senior Counsel:

Avocat principal :

Mr. Denis Saumure

M^e Denis Saumure

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Ottawa, Ontario / Ottawa (Ontario)

--- Upon resuming on Thursday, November 7, 2019
at 9:02 a.m. / L'audience reprend le
jeudi 7 novembre 2019 à 9 h 02

Opening Remarks

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

Mon nom est Rumina Velshi. Je suis la présidente de la Commission canadienne de sûreté nucléaire.

I would like to begin by acknowledging that the land on which we are gathered is the traditional territory of the Algonquin and Anishinabek peoples.

Je vous souhaite la bienvenue and welcome to all those joining us via webcast.

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

On my right is Dr. Sandor Demeter; to my left are Dr. Stephen McKinnon, Dr. Marcel Lacroix and Dr. Timothy Berube.

Mr. Denis Saumure, Legal Counsel to the Commission, and Mr. Marc Leblanc, Secretary of the

Commission, are also joining us on the podium today.

I will now turn the floor to Mr. Leblanc for a few opening remarks.

Marc.

M. LEBLANC : Merci, Madame la Présidente.

Bonjour. J'aimerais aborder certains aspects touchant le déroulement de la réunion.

For this Commission meeting we have simultaneous interpretation. Please keep the pace of your speech relatively slow so that the interpreters are able to keep up.

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.

To make the transcripts as complete and clear as possible, please identify yourself each time before you speak.

The transcripts should be available on the website of the Commission in about 10 days.

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, please silence

your cell phones and other electronic devices.

The agenda was approved yesterday. This morning we will hear the presentation on the Regulatory Oversight Report on Nuclear Substances in Canada, to be followed by an Event Initial Report.

The Regulatory Oversight Report on Canadian Nuclear Laboratories (CNL) Sites will be presented after lunch.

Madame Velshi, présidente et première dirigeante de la CCSN, va présider la réunion publique d'aujourd'hui.

President Velshi.

THE PRESIDENT: The first item on the agenda is the Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2018, as outlined in CMDs 19-M29, 19-M29.A and 19-M29.B.

The public was invited to comment in writing. The Commission received three submissions and we will get back to the submissions after CNSC staff's presentation.

So we will start with you, Mr. Moses.

CMD 19-M29/19-M29.A/19-M29.B

Oral presentation by CNSC staff

M. MOSES : Bonjour, Madame la Présidente,
Membres de la Commission.

Je suis Colin Moses, directeur général de la Direction de la réglementation des substances nucléaires.

Avec moi aujourd'hui sont :

- Sylvain Faille, le directeur de la Division des permis de substances nucléaires et d'appareils à rayonnement;

- André Bouchard, directeur de l'Inspection des activités autorisées;

- Karen Owen-Whitred, Director of the Transport Licensing and Strategic Support Division;

- Mark Broeders, Director of the Accelerators and Class II Facilities Division;

- Sandra Mortimer, Program Officer and lead for this report;

- along with many other CNSC staff involved in the regulation of nuclear substances.

We are here today to present our Regulatory Oversight Report on the Use of Nuclear

Substances in Canada: 2018.

As we will discuss later in our presentation, we continue to mature and modernize our regulatory program, increasingly leveraging our systems and technologies to explore new and innovative ways to regulate the sector, and ensuring readiness for new applications of nuclear technologies.

With the benefit of our systems and analytics, we are now better able to monitor, adapt and target our regulatory interventions, which can take various forms, including communications, licensing and certification, compliance or enforcement, in areas that will have the biggest impact and deliver the best result for Canadians.

If you recall our report last year, you will have noticed that we have made a number of revisions to the structure and format of the 2018 report.

This year, we concentrated on providing useful information to stakeholders on notable performance trends and opportunities for improvement and referencing, rather than duplicating, information already on the CNSC website. This has helped build a much more streamlined report without any substantive changes to the specific performance information included in the report.

In addition, we have highlighted two areas in the report that discuss how we are leveraging these new approaches to effect change in specific subsectors.

We would welcome your feedback on whether you found the changes and the case studies helpful.

Before getting into the presentation, I would also like to note a couple of corrections that we will make to the report, shown on this slide, which were helpfully pointed out in the submissions received on the report.

In particular, while verifying some questions related to worker dose data, we noted that there were some duplicate entries in our master sheet, as well as some entries that had been entered in higher dose categories by accident. These errors have been corrected in the annex of the presentation, which will be integrated into the final report prior to publication. Note that the corrections do not impact any of the trends discussed in this report or CNSC staff's overall conclusions.

Today's report is but one of a series of Regulatory Oversight Reports that together present a comprehensive report on the performance of the nuclear industry in Canada and outline our rigorous and extensive regulatory oversight programs that collectively ensure,

across all activities and facilities that the CNSC regulates, Canadians and our environment are protected.

For the fifth year the CNSC posted the draft report for comments prior to presenting the report to the Commission in order to provide the regulated industry as well as the Canadian public an opportunity to review and provide insights on the information covered in this report.

The draft report was published for a 30-day comment period and participant funding was made available and awarded to two participants.

Through the comment period, the CNSC received a submission from the Canadian Radiation Protection Association, one from M. Benoit Poulet and one from the Canadian Environmental Law Association. Given most of the comments were on specific aspects of the report, CNSC staff prepared supplemental CMD 19-M29.1 that provides a response to the feedback received on this report.

As we noted in previous years, we appreciate stakeholder feedback on making sure that this report provides useful information to the Commission, to licensees and to members of the public. We welcome the intervenors' suggestions for potential improvements to the report, which we will consider for inclusion in future

editions as we work to continuously improve our program reporting.

Following this Commission meeting, CNSC staff will finalize and publish this report, making it available publicly, along with previous editions of the report. We will also profile key findings of the report in an upcoming edition of the DNSR Newsletter.

As mentioned in my opening remarks, we continue to modernize our regulatory report in order to present a clear, easily digestible and comprehensive report on the industry and our regulatory oversight thereof.

With a brief introduction, we will discuss our regulatory oversight program and approaches, outline industry performance trends, focus in on two areas of particular regulatory interest where we have adapted our regulatory approach to respond to performance trends, and discuss the results of our engagement activities aimed at building awareness and driving improvement in the industry.

Je vais maintenant donner la parole à M. Sylvain Faille, qui vous présentera un aperçu de notre programme de réglementation.

M. FAILLE : Merci, Colin.

Sylvain Faille, for the record.

I will start with a brief introduction of

our work.

Nuclear substances and prescribed equipment are used in a broad range of applications. These are regulated under the *Nuclear Substances and Radiation Devices Regulations* and the *Class II Nuclear Facilities Regulations*.

For the purpose of this report, the activities are grouped into four sectors that will be described in more detail in upcoming slides.

The nuclear substances industry in Canada continues to operate safely in 2018.

CNSC oversight activities, including licensing reviews, technical assessments and inspections, confirm that licensees in the sector have appropriate safety programs in place in order to protect the health, safety and security of Canadians and the environment. Further, CNSC staff verified that licensees continue to maintain adequate provisions to implement Canada's international obligations.

Despite the generally strong performance in the industry in 2018, there was one instance where a licensee had an environmental release above a regulatory limit and two instances where workers exceeded the regulatory dose limit for extremities. The two events

involving an overexposure to extremities were reported to the Commission and are discussed in more detail later in this presentation.

I will now provide an overview of the oversight activities performed by the CNSC in 2018.

As indicated earlier, this report covers four industry sectors: commercial, medical, industrial, and academic and research.

The medical sector accounted for approximately 20 percent of the licences held for activities covered by this report. The medical sector covers use of nuclear substances and prescribed equipment for diagnostic and therapeutic purposes. The subsectors included are nuclear medicine, radiation therapy and veterinary nuclear medicine.

The industrial sector accounts for approximately 59 percent of the licences held for activities covered in this report. The industrial sector covers uses of nuclear substances and prescribed equipment in industrial facilities or as part of field work or construction. The sub-sectors included are portable gauges, fixed gauges, industrial radiography and oil well logging.

The academic and research sector accounts

for 9 percent of the licences held for activities covered by this report. The academic and research sector covers the use of nuclear substances and prescribed equipment in universities, colleges and research laboratories for research and teaching purposes. The subsectors included are laboratory studies and consolidated use of nuclear substances.

The commercial sector accounts for approximately 12 percent of the licences held for activities covered in this report. This sector covers the production, processing, storage and distribution of nuclear substances, radiation devices and prescribed equipment, as well as the servicing and calibration of radiation devices and prescribed equipment. In addition, this sector covers the management, handling, storage and processing of low-level radioactive waste generated from nuclear facilities and activities. The subsectors included are isotope production, waste nuclear substances, processing of nuclear substances, distribution of nuclear substances, servicing of radiation devices and prescribed equipment and calibration.

More information on these industry sectors can be found in the technical briefing presentation delivered to the Commission last year and available on the

CNSC website. The link is available in Appendix A of this presentation.

In 2018 there were 2,095 licences held across the country as well as 40 licensees that are based outside of Canada that perform licensed activities within Canada. This represents a slight decrease from last year, where a total of 2,191 licences were reported, including those located outside of Canada. The decrease is seen across all sectors.

Note that the same requirements and expectations apply to licensees based outside of Canada as to those that are based in Canada. Inspections of these licensees may be conducted at locations in Canada when they are performing servicing work or at their headquarters offices abroad.

The subsectors covered by this report are risk-ranked. The risk ranking of the activities is part of the risk-informed regulatory program.

The risk-informed regulatory program provides a relative risk ranking of activities that recognize the potential safety impact of the licensed activities and the likelihood of an incident occurring while conducting the activity. It also provides an effective and informed allocation of oversight effort based

on the relative risk ranking of the activities and considering the performance of the individual licensee.

As a whole, the program provides effective, transparent, consistent and comprehensive regulatory oversight of the use of nuclear substances and prescribed equipment.

The risk-informed regulatory program is documented in the CNSC management system and is re-examined at regular intervals. CNSC staff is currently finalizing the review of the regulatory program.

When an application for licensing or certification is submitted to the CNSC, CNSC staff review the application and conduct a technical assessment to determine if all regulatory requirements are met and that adequate measures are in place to protect health, safety, security and the environment.

A peer review of the assessment is conducted. Once the peer review is complete, the Designated Officer makes a decision on each request for licensing or certification activities based on the evaluation and recommendation made by CNSC staff. A licence or certificate will only be issued if the Designated Officer is confident that the applicant has met all requirements and has the necessary programs in place.

The CNSC publishes Application Guides as part of its REGDOC series to assist applicants. The REGDOCs listed here are the main three application guides that are applicable to manufacturers of prescribed equipment and licensees in the industry sectors covered in this report.

Designated Officers make most decisions related to the regulatory oversight of nuclear substances and prescribed equipment. This slide shows the number of decisions by Designated Officers responsible for these industry sectors. For comparison, data for the last five years are included.

In 2018, Designated Officers made a total of 2,424 licensing and certification decisions related to the use of nuclear substances. Most of the decisions were licensing decisions. These decisions include those related to new licences and certification renewal as well as amendments that account for the majority of the licensing decisions.

As reported last year, there was a decrease in certification decisions of prescribed equipment in 2018 as the situation is going back to normal following the higher than average number of certification decisions due to the expiry and recertification of device

certificates that started in 2016.

Note that all these decisions are also reported to the Commission via the Designated Officer Report.

Compliance activities conducted by CNSC staff include inspections and desktop reviews. The results of compliance activities are documented and non-compliances are tracked until they are addressed by the licensee to the satisfaction of CNSC staff.

In 2018, a total of 949 inspections were conducted for licensees covered under this report.

For nuclear substances and radiation devices licences, the inspection frequencies range from annual for high-risk licences to one inspection every two, three or five years for licences in lower-risk categories.

Annually CNSC staff develop an inspection plans to focus on high-risk licences and prioritize inspections based on a number of factors, including past performance, increased event trends, significant program changes such as a new Radiation Safety Officer, and other factors. This ensures that CNSC staff focus compliance effort on risk-significant activities.

Historically, the primary focus was on high-risk licensees. Over the last five years, while 92

percent of the high-risk licences were inspected within the specified frequency, 60 percent of the medium-risk licences were inspected within the specified frequency. It was also found that the performance of high-risk licensees continues to be strong, whereas performance of medium-risk licensees are declining or stagnating. As a result, CNSC staff undertook a review of the CNSC compliance strategy for these licensees.

CNSC staff modified their approach to planning and prioritizing inspections for the fiscal year 2019-2020, where, as part of the risk-informed regulatory program, a risk-informed decision was made to change the focus from high-risk licensees to prioritize inspections of medium-risk licensees due to the declining or stagnating performance of licensees in this risk category.

In parallel, CNSC staff are finalizing the review of the risk-informed regulatory program and the associated inspection frequency guidelines for NSRD licences to ensure that they provide effective risk-informed oversight of regulated activities.

CNSC staff continue to focus on performance-based inspections as opposed to records-based inspections since conducting performance-based inspections has improved our effectiveness in detecting common areas of

non-compliance.

This slide and the next look at enforcement actions.

When CNSC staff find a licensee in non-compliance, they use a graduated approach to bring the licensee back into compliance and to deter future non-compliance. CNSC staff select the most appropriate enforcement action based on risk-informed decision-making. Orders and AMPs are highlighted in the report and in the presentation, but they are just two of the many tools available.

In 2018, the CNSC took 16 escalated enforcement actions against licensees in the four sectors, including 13 orders and three administrative monetary penalties. Most of the enforcement actions were taken against licensees in the industrial sector, consistent with trends from previous years. In two cases, licensees that received orders have yet to comply with the terms and conditions of the order, so the order remains in place.

The first order was issued to a licensee who uses nuclear substances for diagnostic medical imaging. The order was issued following a CNSC inspection that identified non-compliances regarding the management oversight of the licensee's radiation protection program.

The inspection also identified non-compliances with the maintenance of several records required by the CNSC. As a result, the licensee had to place all of its radioactive materials into secure storage and refrain from obtaining any more until such time that it can demonstrate to the satisfaction of the CNSC that it has implemented an effective radiation protection program and has management control over work practices. The licensee must also satisfactorily address all of the findings of the CNSC inspection that was conducted.

The second order was issued to a licensee that processes nuclear substances used in radiopharmaceutical products. This order was issued by a Designated Officer following concerns over recent events reported by the licensee which identified deficiencies in the company's radiation protection program. The order requires the licensee to cease all processing of Iodine-131 until all items listed in the order are resolved. To date, the licensee has been allowed to resume production of diagnostic quantities of Iodine-131 capsules and still working on the items related to the production of therapeutic capsules.

All administrative monetary penalties issued in 2018 have been paid.

I will now pass the presentation over to Sandra Mortimer.

MS MORTIMER: Thank you, Sylvain.

Good morning. My name is Sandra Mortimer, a program officer in the Directorate of Nuclear Substances Regulation.

In the following section, I will speak to the overall performance of licensees covered by this report. The information presented here is at a high level. More detailed information is available in the regulatory oversight report itself.

The performance of licensees is presented according to three metrics: doses to workers, SCA performance results, and reported events. I will go through each metric in turn.

Starting with doses to workers, licensees are required to implement radiation protection programs that ensure that radiation doses to workers are below regulatory limits and are kept as low as reasonably achievable. Looking at doses to workers as a whole is an indication of how successful licensees are as a group in accomplishing this.

On this slide, you'll see the distribution of workers across the four sectors covered in the report.

Licenseses are required to monitor occupational radiation doses for workers. In 2018, over 50,000 workers in the industrial, medical, academic and research, and commercial sectors were monitored.

Workers who may in the course of their job receive more than 1 mSv per year must be registered as nuclear energy workers, or NEWS. In 2018, 38 per cent of all workers were registered as NEWS. All other workers are referred to as non-NEWS in this presentation and in the report.

This slide shows the doses to workers over the last five years. Doses remained low in 2018, with most workers receiving less than 0.5 mSv per year. No NEWS received doses above the effective dose limit of 50 mSv per year, and no NEWS exceeded the five-year dose limit.

There were two instances in which NEWS received extremity doses above regulatory limits for skin contamination. These will be discussed later in the presentation when covering reported events.

There was one instance in which a workers who was a non-NEW received a dose above 1 mSv, the limit for the public and non-NEWS. This event will be discussed later in the presentation.

Now moving on to look at licensee

performance in select safety and control areas.

The presentation gives performance results and trends in four safety and control areas. These safety and control areas -- management systems, operating performance, radiation protection, and security -- were selected as being representative for the licensees covered by this report and given a holistic overview of their performance. To note, though, while performance in a subset of safety and control areas is included in the presentation and in the regulatory oversight report, it's important to note that all relevant safety and control areas are evaluated during assessments and compliance verification activities.

On the next series of slides, I will present the performance ratings in each of the four safety and control areas, starting with management systems.

In management systems, the performance across all sectors was strong in 2018. Ninety-four per cent of licensees met expectations in this safety and control area. No inspections resulted in unacceptable ratings for management systems. Items of non-compliance were addressed by the licensees.

Moving on to operating performance. The performance in this safety and control area dropped in 2018

compared to 2017. In 2018, 84 per cent of licensees met the expectations in this safety and control area. Four licensees received unacceptable ratings in operating performance. Additional details on the unacceptable ratings will be provided on the next slide. Licensees addressed items of non-compliance when they were detected.

Looking at trends in operating performance, the medical sector performance continued to drop. Both nuclear medicine and radiation therapy licensees experienced a drop in performance in this safety and control area. CNSC staff are exploring different regulatory approaches to improve performance in the medical sector. These will be discussed in a later section of the presentation.

As mentioned on the previous slide, four licensees received unacceptable ratings in operating performance. All four licensees were from the industrial sector. They included one portable gauge licensee, one industrial radiography licensee, one fixed gauge licensee, and one oil well logging licensee.

The reasons for the unacceptable ratings were specific to each case. Some of the contributing items of non-compliance included records of device maintenance not being retained, failure of workers to meet the

regulations related to worker obligations, failure of workers to follow licensee procedures, and vessel entries being conducted contrary to the stipulations of the licence condition.

All licensees have since implemented corrective measures that were reviewed by CNSC staff and were determined to be satisfactory.

In response to the inspection findings, CNSC staff issued orders in three cases. In all three cases, the licensees met the terms and conditions of the orders, and the orders are now closed.

In the fourth case, the CNSC issued an administrative monetary penalty to the oil well logging licensee. The licensee paid the penalty amount. CNSC staff also conducted a follow-up inspection of this licence to verify the compliance and implementation of corrective measures. The licensee had implemented all the necessary corrective measures.

Next is the radiation protection safety and control area. In 2018, 84 per cent of licensees met expectations in radiation protection. Where performance did not meet expectations, licensees implemented corrective measures. Six licensees received unacceptable ratings in radiation protection. Details of these are provided on the

next slide.

In 2018, the academic and research sector experienced a sharp drop in the performance in this safety and control area. CNSC staff will continue to monitor performance in this sector and will take action where appropriate.

The medical sector's performance in radiation protection continued to decline in 2018. This was driven by the performance of the nuclear medicine subsector. CNSC staff are implementing a strategy to improve performance in this area, which will be discussed later in the presentation.

As mentioned on the previous slide, six licensees received unacceptable ratings for radiation protection. Details are shown on this slide here. The licensees with unacceptable ratings included three portable gauge licensees, one industrial radiography licensee, one fixed gauge licensee, and one nuclear medicine licensee. One of the portable gauge licensees, the industrial radiography licensee, and the fixed gauge licensee were the same ones that also received unacceptable ratings in operating performance.

CNSC staff issued unacceptable ratings based on the specifics of each case. Some of the items of

non-compliance that contributed to these ratings included not having survey meters available, having survey meters that were not calibrated within the required time frames, failing to record or ascertain the doses to workers, a lack of radiation safety officer and radiation safety committee involvement in operations, and insufficient management oversight over the radiation protection programs.

CNSC staff issued orders in all six cases that limited or prohibited the work until problems identified during the inspection were corrected. In five of the six cases, the licensee has addressed the items of non-compliance and put in place corrective measures to the satisfaction of CNSC staff, and the orders are considered closed.

The order to the nuclear medicine licensee remains in place. As Sylvain described earlier in the presentation, CNSC staff continue to monitor the licensee's progress in meeting the terms and conditions of the order. The order will remain in place until CNSC staff are confident the licensee can operate safely.

And now we move to the final safety and control area covered in this presentation, security. Overall, performance in the security safety and control area was good. In 2018, 92 per cent of licensees met the

expectations for this safety and control area. Items of non-compliance were addressed by the licensee to the satisfaction of CNSC staff.

One licensee received an unacceptable rating for the security safety and control area, and this case will be described on the next slide.

On May 31st, 2018, REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*, came into force for all categories of sealed sources. This implementation date has influenced performance in the security safety and control area over the last few years. For instance, the sharp decline in performance seen in the academic and research sector in 2018 is related to an increase in items of non-compliance tied to the implementation of REGDOC-2.12.3.

Conversely, as a success story, the medical sector showed an improvement in performance in security in 2018 compared to the two previous years. In preparation for the May 2018 implementation date of REGDOC-2.12.3, CNSC staff conducted focused security inspections of radiation therapy licensees with category 3 sources to identify deficiencies relative to the requirements of the REGDOC. Licensees corrected the items of non-compliance, and based on the work done in advance of

the REGDOC's full implementation, CNSC staff expect that security ratings for the radiation therapy licences will continue to improve beyond 2018.

As noted on the previous slide, one inspection resulted in an unacceptable rating in the security safety and control area. In this situation, a worker left a portable gauge unattended at a work site. CNSC staff issued an order as a result of the incident. The licensee has since complied with the terms and conditions of the order, and the order is closed.

The next performance measure we will look at is reported events. Licensees are required to have programs in place for the management of unplanned events and accidents. The *Nuclear Safety and Control Act*, regulations made pursuant to the Act, and licence conditions set out when licensees and other users of nuclear substances and prescribed equipment must report unplanned events to the CNSC.

When a licensee or other user reports an event to the CNSC, CNSC staff review the information in the report and assess the proposed corrective measures. All reported events are tracked by CNSC staff.

CNSC staff assign a ranking to each event based on the International Nuclear and Radiological Event

Scale, or INES. INES is a seven-point tool used for communicating the safety significance of events to the public. Note that the rankings provided in the report and in the presentation are those of CNSC staff.

This slide gives a short description for the three lowest INES levels and for level 0, which is considered below the scale. The events reported to the CNSC for licensees covered by this oversight report typically fall in level 0, level 1, or level 2.

In 2018, 195 events related to the use of nuclear substances and prescribed equipment were reported to the CNSC. Most of these were ranked as INES level 0, having no safety significance. Three events were ranked at level 1, or anomalies on the scale, and two ranked at level 2, or incidents. I will provide additional details on these events in subsequent slides. Short descriptions of all events are provided in the regulatory oversight report.

This slide shows the number of events reported to the CNSC in each of the last five years. Overall, there was an increase in the number of events reported to the CNSC in 2018. The increase was in the number of level 0 events and reflects an improved reporting culture of licensees, which is an outcome of specific outreach activities that CNSC staff have been conducting in

recent years.

If we look at the types of events that were reported, CNSC staff saw an increase in the number of reported events involving malfunctioning and damaged devices and the number of events related to packaging and transport.

The majority of events related to malfunctioning devices were related to shutters being stuck on portable gauges and fixed gauges. These occurrences are often a combination of the dirty settings where the devices are used and inadequate maintenance of the device or operator errors.

The events related to damaged devices are generally the result of devices falling, something falling onto a device, or portable gauges that are damaged at construction sites.

In the area of packaging and transport, there was an increase in the number of motor vehicle collisions with no injuries and no damages to the packages being transported. CNSC staff view this increase as a reflection of licensees' and users' improved awareness of reporting requirements.

CNSC staff assessed all reported events and corrective actions implemented by licensees. On the

next slides I will provide details on the events that CNSC staff assessed to be either INES level 1 or INES level 2.

This slide gives information about the first INES level 1 event. In this situation, a portable gauge went missing from a construction site when the worker left it unattended. The licensee searched the work site for the gauge but were unable to find it. They informed the local police and yet the gauge has not been recovered.

When CNSC staff was notified of the event, CNSC staff updated the report of lost, stolen, and found sealed sources on the website. CNSC staff also sent a notification that included facts about the event and the radiation device in question to a pre-determined distribution list. The licensee implemented corrective actions, including holding regular safety and security meetings with all portable gauge users.

CNSC staff assessed this event at INES level 1 due to the fact that the sealed source involved was a low-risk category 4 sealed source and that has not been recovered. The event is considered closed.

Now for the second level 1 event. This event involves a portable gauge that was discovered outside regulatory control at a scrapyards. The scrapyards notified the CNSC of the discovery.

Based on the report from the scrapyard, CNSC staff conducted an investigation to find out who the owner of the gauge is or was. The investigation determined that the gauge belonged to a company that is now bankrupt, whose assets had been sold to another company. CNSC staff arranged for a licensed service provider to retrieve the device from the scrapyard and arrange for its disposal. The CNSC used the financial guarantee program to recoup the costs associated with retrieving and disposing of the radiation device.

The CNSC staff investigation determined that this fixed gauge model was exempt from licensing prior to the introduction of the *Nuclear Safety and Control Act*. In response, CNSC staff contacted the manufacturer to find out who else in Canada may have purchased a similar device prior to the time that a licence was required. In addition, staff followed up with these companies to ensure that if they still had the device they were properly licensed. Staff also sent a reminder letter to the manufacturer, indicating the Canadian requirements for licensed activities. CNSC staff also contacted the Canadian Association of Recycling Industries, or CARI, to let them know what happened in this event and what type of gauge to be on the lookout for in case they find one in

their own facility.

The event is considered closed.

And now the final level 1 event. This event was assessed at level 1, involves a non-NEW that received an annual dose over the regulatory limit. The event was previously reported to the Commission as an event initial report, or EIR. The worker's dosimeter reading was 1.06 mSv, which was above the dose limit of 1 mSv per year. The event was reported to the CNSC.

CNSC staff tried to recreate the conditions to estimate a dose, but were unable to recreate a reading above 1 mSv, thus concluded the dose are likely non-personal. However, the employer could not justify the non-personal dose based on the worker's accounts, and so to be conservative kept the personal dose on the worker's record.

In response to the event, the employer issued electronic personal dosimeters to all workers in the baggage handling area and altered their procedures for dosimeter sign-in and sign-out and the frequency at which dosimeters were being read. CNSC staff consider the event closed.

Next, we'll move on to the two events that were assessed by staff to be INES level 2. Both events

involve nuclear energy workers who exceeded the dose limits for exposure to the skin.

In the first event, a nuclear medicine technologist spilled technetium-99m on their wrist while performing a diagnostic procedure. The syringe shield slipped in the technician's hand, and consequently technetium-99m squirted onto their wrist. The individual immediately removed their lab coat and gloves and proceeded to decontaminate themselves. The individual received a dose of 3600 mSv as a result of the incident, which is above the limit of 500 mSv.

The licensee assigned the worker to other duties to prevent further exposures. The licensee investigated the incident and determined the cause was a loose syringe shield. In response to the event, the licensee discussed the event with their staff during a lessons learned session, and in addition, purchased new protective equipment, or PPE, that should reduce the chances of a similar event occurring.

CNSC staff previously presented this event to the Commission in the form of an EIR. CNSC staff issued a return to work letter to the worker when the event was closed.

The second event assessed at INES level 2

involved a nuclear energy worker who received skin contamination on their thumb from iodine-131. The NEW was dispensing therapeutic iodine capsules using a robotic dispenser. They encountered problems with the dispenser. To remedy the situation, the individual performed maintenance tasks on the machine, including changing needles. After completing the maintenance tasks, the individual did a self-check for contamination and noticed that their gloves and sleeve covers were contaminated. They proceeded to remove the contaminated covers and items, but did not recheck for contamination. The next day, the individual measured contamination on their thumb.

The dose received by the individual was determined to be 1700 mSv, which exceeds the dose limit of 500 mSv. The thyroid uptake was estimated at 0.12 mSv. The worker has not reported any adverse effects. CNSC staff had previously reported this event to the Commission as an EIR.

In response to the exposure, the licensee removed the worker from any tasks that may increase their dose. The licensee conducted additional thyroid and skin monitoring.

CNSC staff conducted an unplanned inspection of this licensee. Based on their inspection and

the event, CNSC staff issued an order to stop work until the appropriate procedures are in place and a new facility for the production of therapeutic iodine is available. The licensee has been working to meet the terms and conditions of the order, but has not met them all yet.

The event is considered closed. The order is still open.

At this point, I will turn the presentation back to Colin Moses.

MR. MOSES: Thank you.

So before getting into the case studies, I just wanted to provide an overview on why we introduced this new feature to our report and discuss how we are leveraging a host of new approaches and innovative ways aimed at driving improvement in our regulated sectors.

As you have seen, we use a wide variety of metrics to monitor the performance of licensees. We base our regulatory oversight strategies on a broad spectrum of indicators that allow us to maintain a holistic view of industry performance. These formal and informal metrics give us insights into the effectiveness of our regulatory oversight programs both at the level of regulated activities and with respect to individual licensees. So for example, certification gives us an early indication of

potential hazards from the use of prescribed equipment. Licensing allows us to gauge the readiness of applicants and, if necessary, engage more actively before granting a licence. Similarly, we have developed indicators that help inform our annual inspection planning and other reactive oversight activities.

Using the insights from our performance monitoring activities, we develop and adapt targeted strategies to drive improvement when industry performance trends identify a need for a regulatory intervention. As a special feature in this year's report, we have delved into more detail for two subsectors whose performance triggered a need to adapt our regulatory strategies. We hope these case studies demonstrate some of the ways that the CNSC maintains a modern, agile, and evidence-based regulatory oversight of the nuclear industry.

We have chosen to highlight two specific subsectors in these case studies. The first is retrospective, presenting a sector that was showing declining performance and triggered a change in our regulatory approach. In this case, the challenges and issues were clear from our monitoring data and allowed us to design targeted interventions aimed at driving industry performance improvement. This strategy was implemented

over the last few years, and we now have some trending information that allows us to monitor, adapt, and focus our program as we move forward.

The second subsector is one that is in a critical moment of change. We have seen the impact of those changes in their performance results. In this case, the programs are complex, and the factors influencing performance are impacted by broad policy decisions, such as consolidation of health authorities, that go far beyond their nuclear programs.

In this case, rather than risk charging in with actions that may not be targeting the true causes of this decline, we used an innovative and creative approach to gather data and inform our regulatory response. This helps ensure that we use an evidence-based approach to specifically target the areas that are having a direct impact on performance.

So without further delay, I'll turn the presentation over to Mathieu Laflamme to discuss the portable gauge sector.

MR. LAFLAMME: Thank you, Colin.

Good morning. My name is Mathieu Laflamme, and I am a project officer in the Operations Inspection Division.

In the next five slides, I will be providing information of the portable gauge subsector and the regulatory strategy that was developed and implemented by CNSC Staff to address decline in performance and performance that does not meet expectations. This strategy began in 2010 and continues today.

Let's begin by highlighting some of the characteristics of the portable gauge subsector.

Portable gauges are used in industries such as agriculture, construction and civil engineering to measure moisture and compaction levels in soil and asphalt density and paving mixes.

The use of portable gauges is considered medium risk as per the risk ranking from the risk-informed regulatory program and involves the use of sealed sources. There are two types of sources used in portable gauges, gamma emitters such as cesium-137, and neutron-emitting nuclear substances such as americium-241 and beryllium.

Portable gauges are operated by workers in the field, which involves being away from the radiation safety officer working at busy construction sites and having to transport gauges to and from job sites and, therefore, must be trained in accordance with the Class 7 Dangerous Goods Regulations.

Portable gauges users must ensure the safe conduct of their work and comply with all applicable regulatory requirements as well as comply with the radiation protection program established by their employer.

The portable gauge must be either under the constant surveillance of a worker, secured in a transport vehicle, or at the storage location.

The portable gauge subsector involves a transient workforce where there's a high worker turnaround and work is seasonal. Licensees must ensure that their workers are adequately trained to perform their duties.

This slide presents a graph representing the historical performance of the portable gauge subsector over the last decade. As shown by the graph, performance and duration protection and operating performance safety and control areas was low starting in 2008, but continued to improve until 2015.

In 2015, performance started to decrease and then continued to decrease from 2015 to 2017 before starting to improve again in 2018.

I will first discuss the performance trend between 2008 and 2015.

During this time, inspections have been mostly records based at the licensee's head office. The

improvement in performance that was observed was caused by licensees addressing findings from the records-based inspection approach.

Although inspection performance improved, the number of orders issued to portable gauge licensees continued to increase each year due to the non-compliances observed when field inspections were performed. As a result, CNSC Staff changed its inspection strategy in 2015 from primarily conducting records-based inspections to focus more heavily on conducting performance-based inspections in the field and observing workers operate the gauges.

This change in inspection approach correlated with the decline in performance in the operating performance and radiation protection safety and control areas due to the increase in non-compliances that were observed.

Performance in these safety and control areas continued to decrease from 2015 to 2017 as CNSC Staff were becoming more and more effective at conducting performance-based inspections and finding non-compliances.

From 2017 to 2018, you will notice the inspection performances starting to increase and the number of issued orders have started to decrease.

This slide presents the CNSC response to the performance of the portable gauge subsector which involved implementing a strategy with two major components; an outreach campaign and a compliance verification strategy.

I will begin with speaking on the first major component, which is the outreach campaign.

In 2010, due to the observed low performance of the portable gauge subsector, CNSC Staff formalized a working group to develop a unified strategy for outreach to portable gauge licensees. As a result of this working group, CNSC Staff piloted a workshop of portable gauge licensees in 2014 with the focus on providing radiation safety officers with information on licensing and compliance expectations.

The workshop consisted of presentations delivered by CNSC Staff, question and answers, and general discussions. The feedback received was extremely positive and, as such, an outreach campaign was launched by CNSC Staff.

As part of this campaign, presentations related to the safe use of portable gauges and compliance expectations were developed and workshops were offered across Canada starting in 2015. A total of 28 workshops

have been held between 2015 and 2018. Feedback continues to be positive, and presentations are given upon request.

In addition to the workshops, CNSC Staff developed easily-accessible resourcing material intended for portable gauge users, including a quick reference guide in 2015, the "Working Safely with Portable Gauge" booklet that was created in 2015 and later updated in 2018, and a safety video for portable gauge users in 2018.

These references are available on the CNSC's portable gauge web page.

To inform portable gauge licensees of these tools, CNSC Staff have published articles in the DNSR newsletter, sent direct emails to portable gauge licensees, and promoted the tools during face-to-face interactions with licensees.

I will now speak on the second major component of the regulatory strategy, which is the compliance verification strategy that was implemented along this outreach campaign.

As mentioned in the previous slide, in 2015 CNSC Staff changed its strategy for how portable gauge licensees are inspected. The focus changed from primarily conducting records-based inspections at the licensee's head office to conducting performance-based inspections in the

field and observing workers operate the gauges.

The change in inspection strategy allows for early detection of non-compliances that would not have been otherwise observed if only a records-based inspection had been completed.

CNSC Staff continue to monitor the performance of the portable gauge subsector and continues to provide guidance and outreach as well as its performance-based inspection strategy. Performance of this subsector is improving where we are seeing the number of annual doses over 1 mSv is decreasing and inspection performance is improving.

These observations could be an indication that the interventions and outreach put in place by CNSC Staff are having the desired effect. Workers in the portable gauge subsector are performing their duties in a safe manner.

CNSC Staff continue to engage with licensees in this subsector through existing methods and are exploring new and innovative ways to provide portable gauge workers the information they need to operate safely. CNSC Staff provide seasonal mailouts to portable gauge licensees to remind them of safe work practices and of the tools that are available.

CNSC Staff are continuing to improve how information is provided and are currently working on developing a mobile application that can be used for portable gauge workers.

CNSC Staff are also continuing to monitor and track performance through compliance activities.

I'll now turn it over to Natalie Ringuette to discuss the nuclear medicine subsector.

MME RINGUETTE : Bonjour. Mon nom est Natalie Ringuette. Je suis agente de projet des permis de la Division des permis de substances nucléaires et appareils à rayonnement.

In the next six slides, I will be discussing a case study in the nuclear medicine subsector.

Let's begin by highlighting some of the characteristics of the nuclear medicine subsector. Like portable gauge, nuclear medicine licences are classified as a medium risk as per the risk ranking of use types under the risk-informed regulatory program.

The major difference from the portable gauge licensees is the handling of unsealed nuclear substances.

Unsealed nuclear substances are handled for the purpose of administering diagnostic and therapeutic

doses to patients. This is performed in a controlled environment such as in medical clinics and hospitals.

Additionally, only registered nuclear medicine technologists and physicians are authorized to handle the nuclear substances. The registration with the College of professionals ensures that the authorized individuals meet the professional practice requirements and that they are legally authorized to practise the profession.

As shown by the graph, a decline in performance in the radiation protection SCA and the operating performance SCA have been observed over the last four years. The noted deficiencies can be indicative of weakness in licensees' development and implementation of their radiation protection program.

As a result of this noted decline, the CNSC took action in 2016 by shifting the focus of their inspection strategy from record-based to performance-based inspections, which was a similar approach used for portable gauge and industrial radiography licensees.

This change in strategy allowed for early detection of non-compliances that may not have been otherwise observed if only a record-based inspection had been completed, thus increasing CNSC's effectiveness in

identifying non-compliances.

In a more global effort, CNSC performed a structured evaluation to study the challenges faced by radiation safety officers in the medical, academic and research subsectors in 2017.

An evaluation is an evidence-based approach to regulations to systematically get to the root of the challenges and to develop strategies to target these challenges specifically. The evaluation was performed to clearly understand the issues contributing to the decline in licensees' performance, therefore allowing CNSC Staff to implement an oversight strategy targeting those specific areas.

The result of the evaluation is being used to guide CNSC Staff in developing a regulatory guidance document for licensees on the design and implementation of an effective radiation protection program.

The evaluation focused on two subsectors, medical and academic research, as these licensees have more complex radiation protection programs.

The focus was primarily at the contribution of the RSO to the effective implementation of the radiation protection program, as these individuals are an important element in the management of the licensee's

radiation protection program.

The evaluation also took into consideration a variety of factors such as the level of complexity of the licensee's operation, differences in organization size and the geographic disparity of licensed locations.

The evaluation found that RSOs have capability, opportunity, motivation to deliver effective radiation protection training, disseminate information and conduct monitoring and oversight activities.

It also identified challenges. For example, RSOs in large institutions appeared to face more challenges due to the budget constraints, complexity of operations and focus on patient care.

They also face some unique challenges, especially if they lack sufficient time to fulfill their RSO duties, which may be because they are part-time RSOs managing complex radiation protection programs and operations are spread across different locations. Additionally, direct patient care often take precedence over their RSO duties.

Other barriers noted during the evaluation are lack of time, lack of funding, lack of management support, lack of adequate online resources impact access to

continuous improvement activities to varying degrees.

The recommendations from the evaluation were used to fuel the plan for improving performance of nuclear medicine licensees.

The short-term plan for regulatory intervention for nuclear medicine licensees in the current fiscal year includes a revised inspection planning process to include more nuclear medicine licensees. In the past, many were inspected less frequently than baseline frequency.

The planning process was altered to change the focus from high-risk licensees to prioritizing inspections to medium-risk licensees, including the nuclear medicine licensees with declining or stagnating performance and those licensees that have not received an inspection within their baseline inspection frequency.

This change is to ensure sufficient regulatory oversight of the licensees' regulated activities is provided.

In addition, a review of the adequacy of the existing outreach and communication tools was conducted in order to identify opportunities to better reach all RSOs.

In the medium-term plan, CNSC Staff is

developing a Regulatory Document to provide guidance to licensees on developing and implementing an effective radiation protection program, REGDOC-1.6.2.. The document will soon be available for public consultation.

And following the review of communication tools, we will modernize the communication and outreach tools and develop tools that specifically target licensees that are struggling to meet regulatory expectations or who are showing declined performance.

As with any action plan, we will continue to monitor performance of licensees and will adjust the plan if necessary.

I'll now turn the presentation over to Colin Moses.

MR. MOSES: Thank you.

So I hope these helped highlight the benefits of our continued and strategic engagement with regulated industries. In contrast to the other sectors regulated by the CNSC, who have captive audiences, the nuclear substances and prescribed equipment sector is diverse and dispersed across the country. That is why we recognize the importance of regular broad and targeted communications with the regulated industry.

It goes without saying that we recognize

the importance of keeping licensees and the public aware of and engaged in our regulatory programs.

With that said, one of the key findings that was evident in the evaluation of the medical and academic sectors is that those that are strong, capable and adequately resourced are already actively engaged in our regulatory oversight. They pay attention to our communications, they attend our outreach sessions and they actively engage with our licensing specialists, project officers and inspectors.

However, that's not typically where we see the worst performance. It's with those licensees that don't have an engaged leadership, who don't have enough resources to keep their head above water, who aren't focused on learning and continuous improvement, who aren't committed to excellence.

To use a couple tropes, we need to ensure that our outreach engagement activities are not just preaching to the converted or screaming into the wind. That's why we launched a review of our engagement tools and strategies in order to bring together a set of tools that are specifically designed to give a helping hand to those that are struggling.

We talked about the quick reference

handbook and video in the portable gauge sector. We're also using increased and focused communications on safety issues and trends, experimenting with behavioural economics insights to engage leadership and even experimenting with a great app that was developed by a couple of our innovative staff members, who saw a gap and took it upon themselves to build something that can be installed on any cell phone and presents our information and tools in a way that is accessible and relevant to licensees.

We will continue to experiment with these big and small innovations, monitoring and adapting our tools in ways that support and drive excellence in the nuclear substances and prescribed equipment sector.

Before wrapping up, I also wanted to highlight some of the activities that are keeping us busy this year.

In response to the continued diversification of licensees that fall into this program, we have launched a project to review how we regulate those applications that include varied and diverse uses of nuclear substances which don't naturally fall into one of our established subsectors.

For these licensees, we are collaborating with the Directorate of Nuclear Fuel Cycle and Facilities

Regulations to explore the application of their mature and robust regulatory approaches to the nuclear substance and prescribed equipment sector.

In addition, as we noted, we have transitioned our compliance programs to focus on performance-based and field inspections. These changes have driven some real improvements in our capacity to detect and address non-compliances where they're happening.

However, moving into the field and focusing on performance means each inspection takes more effort.

In 2018, we launched our five-year review of our risk-informed regulatory program. This review will introduce two new dimensions to our inspection strategies.

First, we are directly integrating performance information into our baseline program so that the inspection frequencies are not just based on relative risks of the regulated activities, but also are responsive to the trends in performance of each subsector.

Second, we have embedded our resource management strategies and integrated key safety performance indicators that will allow us to build annual inspection plans that reflect the inspection capacity and target areas that might warrant off-normal oversight.

Recognizing the concerning trends in the medical sector, we will focus on implementing the evidence-based regulatory interventions we discussed earlier and will continue to track key indicators to assess the impact of our oversight and to adapt and adjust course as we monitor the effectiveness of our interventions.

Finally, our regulated industries continue to evolve. Just to give you a sense of some of the developments we saw in 2018, there was continued movement towards hybrid imaging and treatment with the first hybrid MRI-Linac in Canada starting commissioning.

In addition, the gamma pod unit in Ottawa was under construction, which uses techniques previously limited to brain tumours for breast cancer treatment. It is expected to receive its sources this year, allowing it to move into clinical trials.

In nuclear medicine, we see increasing interest in theranostics techniques as well as a particular focus on alpha emitters to better target and treat tumours with reduced impact on surrounding tissue.

In the industrial sector, we're seeing increased use of mobile accelerators for cargo screening at ports and border crossing. Also, the legalization of marijuana for medical uses led to the construction and

commissioning of an accelerator dedicated to the sterilization of medical grade marijuana.

These new applications bring new hazards and new dimensions that challenge our regulatory framework and our approaches. We continue to monitor and adapt to these developments, building a more agile and responsive framework and regulatory program.

Through the continuous monitoring and by leveraging the extensive performance data collected through our regulatory oversight activities, CNSC Staff adapt and respond to performance trends, building an agile and comprehensive regulatory oversight program that drives licensees towards excellence in nuclear safety.

We have focused today's presentation on areas of challenge, highlighting adverse performance trends and sharing lessons from licensees that have struggled.

We have focused on areas of negative performance which present a valuable opportunity to improve. However, when we step back and assess the extensive data collected through our regulatory oversight activities in its totality, including trends in worker doses, inspection performance, event trends, et cetera, we can conclude with confidence that the industry continues to operate safely and that the use of nuclear substances and

prescribed equipment in Canada is safe.

This concludes our presentation, and staff remain available to answer any questions you may have.

THE PRESIDENT: Okay. Thank you very much for an excellent presentation.

Prior to opening the floor for questions from Commission Members, on the report, we'll now proceed with the written submissions filed by the intervenors.

Marc, if you can please lead us through that.

CMD 19-M29.1

Written submission from Benoit Robert Poulet

MR. LEBLANC: Thank you.

So the first submission is from Mr. Benoit Robert Poulet as outlined in CMD 19-M29.1.

Are there any questions from the Members on this submission?

Dr. Demeter.

MEMBER DEMETER: Thank you very much. It was an excellent report. Thank you.

In his intervention, he raises a theoretical question about what the implications are for a

worker who exceeds their 100 mSv in the five-year period, what are the next steps.

So I guess it might be interesting to -- have we ever been in that situation where someone has, over their five years, exceeded the 100 mSv, and what's the implications for the worker in that type of scenario?

We've dealt with extremity doses. We've dealt with -- we may be dealing with length of dose down the road. But for a whole body effective dose for the five-year period.

MR. MOSES: Thank you. Colin Moses, for the record.

So I think it'd be best to pass this question right back to our experts in radiation protection who can speak to our general oversight of the program as well as the impact -- implications of that five-year dose limit.

MS PURVIS: Good morning. I'm Caroline Purvis, the Director of the Radiation Protection Division.

There have been in the early 2000s -- when the new Act and Regulations came into force, there was a handful of workers that went marginally over the 100 mSv over five years. I think that was primarily a function of managing both the exposures within the annual dose limits

and within the five-year dose limits.

They were -- and I'm working mostly on my memory, so they were mostly in the industrial sector, so industrial radiographers who have generally a higher potential for elevated exposures relative to other nuclear substance type activities.

Just to wrap that up, over the past full five-year period, and since about 2010, we haven't observed anyone that has exceeded the five-year limit.

If it were to come to pass that a worker either received an acute exposure that was in excess of the 100 mSv or an incremental exposure over that five-year period, there's a number of obligations on the licensee that is specified in the Radiation Protection Regulations, that is they would have to remove that worker from work, that would add to their exposure, conduct an investigation, and then determine what corrective actions would be necessary to prevent any kind of reoccurrence.

With respect to the individual, if that individual or the licensee were to seek a return to work for that worker, they would have to indicate that request to the CNSC, we would assess their corrective actions, and also the individual nature of that case. That is to say whether it was necessary to specify certain conditions for

their return to work. That could be anything from more training, pro-rated dose limits, for example, medical surveillance. That would be commensurate with the dose that would be received by the worker.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: I have a follow-up to that. One of the events reported here was a worker who exceeded the dose limit for the extremity taken out from doing radioactive work. Has that work come back and then, again, just let me know what that process would be. If they haven't come back, when does one expect that to happen?

MS PURVIS: So there were three events. So I'll speak of the two that were for nuclear energy workers.

They were both in the medical sector, one was radiopharmaceutical sector. They were both skin contamination events to the hands. In both cases, they have submitted a return-to-work request, which was granted.

In these cases, there was no recommendations for medical follow-up. No health effects were expected.

In the case of the non-NEW worker, this actually was not a worker of a licensee, and there's been

no return to work.

THE PRESIDENT: So maybe I've missed it, but I don't think the ROR says they've come back to work. I think it kind of leaves it a bit open-ended.

Then just again to close the loop on that. I think the executive summary just says, you know, two nuclear energy workers exceeded the dose limit. It doesn't give any details. If someone who's only reading the executive summary, I think it would be helpful to say what the dose was and how no health effects are anticipated.

I think that would be good. Thank you.

MR. LEBLANC: Are there questions from the Members? Dr. Berube.

MEMBER BERUBE: Just a general comment on the staff responses to the intervenors. It's very well done. Thank you very much for the effort to actually get into, you know, a reasonable response to some of the concerns raised by all the intervenors. In this particular case, I'm satisfied with the responses to the intervention. Thank you.

MR. LEBLANC: Madam Velshi.

THE PRESIDENT: One of the questions raised by the intervenor was the other SCAs outside the four that have been reported. It was just to confirm that

if your assessment showed a negative trend developing or a below expectation performance, that would be included in the report, right?

MR. MOSES: Colin Moses, for the record. Absolutely. We do monitor the performance across all SCAs and look at the results of those.

Maybe I'll turn to Ms Mortimer who could speak to how we collect that data and analyze that prior to actually drafting the Regulatory Oversight Report.

MS MORTIMER: Sandra Mortimer, for the record. So to follow-up with what Colin was saying, we've chose those four SCAs for historical reasons, but mostly because they provide a holistic overview. We have added SCAs as time has gone on through the ROR reports. For instance, management system was added a few years ago.

We do look at the other SCA performance and also we'll note if -- they tend to be reflected in events and AMPs or orders. So the enforcement actions also reflect the performance and hint towards where there may be problems or trends. So we would, if we do notice something in a different SCA, bring it up as part of the ROR.

CMD 19-M29.2

Written submission from

Canadian Radiation Protection Association

MR. LEBLANC: Any other questions from the Members? No? Thank you. So we'll move to the next submission, which is from the Canadian Radiation Protection Association as outlined in CMD 19-M29.2.

Any questions from the Members on this submission? Dr. Berube.

MEMBER BERUBE: I just want to give you the opportunity here to respond to an assertion made in Section 6.3 that suggests that the CNSC has gotten soft with regard to the medical sector.

Would you care to comment on that?

MR. MOSES: Colin Moses, for the record. In our supplemental CMD I wouldn't qualify our reaction to performance as soft or hard. What we look at choosing is a best too to effect the best performance.

So in some cases, like the industrial sector, typically a more prompt escalation of enforcement actions to an order or to an administrative monetary penalty is appropriate.

In other cases, particularly in the

medical sector, we've had great value through engagement with the leadership in the hospital, typically the programs are a small piece of their attention. So us engaging with them and bringing that to their attention has a great effect on the overall performance of the program.

So to speak to that, maybe I can ask Mr. André Bouchard or Lucie Simoneau to speak to some recent engagement that we've had in the medical sector.

MME SIMONEAU : Oui. Je vais vous répondre en français. Donc, si vous pouvez mettre vos...

Lucie Simoneau, pour la traduction.

--- Pause

MME SIMONEAU : O.K.

On ne peut pas dire qu'on est plus facile avec le domaine médical. On a plus de facilité d'approche avec les responsables de la radioprotection et les responsables des demandes de permis. Donc, lorsqu'on fait des inspections au niveau des hôpitaux, maintenant on est beaucoup plus l'approche justement sur la performance, donc sur l'observation des travailleurs. On fait beaucoup moins d'observation de documentation. On va plus sur vraiment qu'est-ce qui est essentiel.

Et lorsque, durant l'inspection, on a des signaux qui nous disent qu'il y a vraiment une

problématique, on va demander tout de suite, on s'adresse au responsable de la radioprotection puis on va demander à voir le responsable de la demande. Du fait qu'on est dans un environnement contrôlé, on a moins besoin de faire appel, soit à des ordres, pour forcer le responsable de la radioprotection à prendre certaines mesures, sans avoir un impact au niveau du fonctionnement de l'hôpital, mais on va aller beaucoup plus au niveau de la discussion. On peut amener aussi certains de nos directeurs à rencontrer les responsables de la radioprotection ou le responsable de la demande pour que ces gens-là comprennent un peu mieux les réalités de leur personnel sur leur terrain. Ils ont beaucoup de pression et dans certains cas les responsables de la demande ne sont pas tout à fait au fait de ces demandes-là.

Donc, c'est de cette façon-là qu'on approche plus le lien avec les hôpitaux, mais on n'est pas vraiment plus facile en arrivant non annoncé. On ne veut pas déranger les opérations, mais on observe.

M. LEBLANC : D'autres questions des Commissaires? Other questions?

Dr. McKinnon.

MEMBER MCKINNON: Yes, thank you for the presentation. It's very interesting.

I got the impression from the CRPA submission that they would like to have more engagement. So my general question is, do you actually seek out and work with professional organizations in general, others as well?

MR. MOSES: Colin Moses, for the record. Absolutely. I would like to point out that the Canadian Radiation Protection Association is one of our key stakeholders.

So we actually have two working groups that we've established with the CRPA: one is focused on sort of the larger activities of the organization in the nuclear substance and prescribed equipment; we also have a joint working group both with the CRPA and the Canadian Organization of Medical Physicists to look at the application and our oversight and trends and get input on initiatives in the accelerator world.

So I think we have quite extensive engagement already with the CRPA and definitely value their input through general Q&As that we have at the annual general meetings of the CRPA, but also when we're launching regulatory initiatives they tend to be very actively involved in the comment period and bring together the comments from their members to give us good comprehensive

input on our new regulatory proposals.

MR. LEBLANC: Any further questions?

President Velshi.

THE PRESIDENT: Thank you. We had a bit of a discussion on the same issue yesterday, this is about reported events and the level of detail that's publicly available on not just the most significant ones, but all event reports. This was with respect to nuclear power plants yesterday.

The general feedback from the licensees is that there's very little interest that has been shown on that. So licensees, on their website, will just have the title of the event, and if someone was interested they would have to ask for more.

But when the CRPA says, well, you know, just having a one-liner explaining the event and, as you said, they're a key stakeholder, they don't want the NRC style on that.

How difficult would it be to provide a one-liner, and would this just be just too onerous and little value associated with that? Have you considered that?

MR. MOSES: Colin Moses. So we have spent the last five to eight years looking at ways to better

share the lessons learned from events and have implemented a number of actions that aren't at the level of every single event reported to us just posted in a proactive disclosure manner on the website. But really look at the trends that we're seeing from sequences of events and highlight those in different ways to the regulated industry.

So, for example, we may see an increase in trends in vessel entries without appropriate worker protections or dose monitoring. So we would develop and design an article or a safety bulletin that we then send to those licensees who undertake those kind of activities to highlight the kind of events, the consequences of those events, as well as the corrective measures that might be necessary.

Similarly, we've done that for cases of portable gauges being left unattended, et cetera, et cetera. So our focus when we analyze and trend events is really on communicating the lessons that we think should be shared with the broader regulated community.

With respect to the public, there does tend to be a fair low level of interest in our regulated activities, with the one notable exception of transport incidents. So in those cases we do have a much more

proactive release of those events on the CNSC website just to bring broader general awareness of the circumstances of events, the impacts and the corrective actions.

But, as I said, our key focus is to extract and do that trending ourselves so that the important lessons aren't drowned out in a list of 250 line items and are highlighted and brought to the attention of those who can make changes in their own programs and adapt and adjust course accordingly.

But to answer your question in terms of effort, we do track and record events on internal systems. We don't have systems right now that are capable of putting those out publicly, and so it would be a manual exercise, involve translation, editing, et cetera.

So to this day, we haven't put in that additional effort to focus in on that area, because we think we're achieving those objectives through a better and more targeted means with our direct communications and safety bulletins.

THE PRESIDENT: I think that's fair enough. It's just that that's done through our eyes and what we think is important, and someone else is maybe looking at things differently. I think it's just one that, as technology improves and people can harvest data

differently, someone may be interested in something quite different from us and how do we make that readily available. Just something to keep our eyes on as we move ahead.

As I said, because it's the CRPA vested interest, key stakeholder, and if they think there'd be value in providing that, it just needs serious attention.

MR. LEBLANC: Dr. Demeter.

MEMBER DEMETER: Thank you again. I think one of the key messages from this sort of CMD and intervention, to me, is relative to -- it's all found on slide 28, figure 15 and 16, and table 4, is the declining performance, especially of the medical sector.

You talked about trying to do more of an analysis of causes. I don't think you used the word root cause analysis that you might see in another industry, but it's sort of looking at whether it's healthcare transformation, budgets, support, and the trends aren't comforting to people who look at this from 2014-2018. You know, they would raise concerns by anyone looking at this externally as a member of the public.

One of my concerns, and I want to see how you address this, is it's an upstream/ downstream thing. So downstream you go do the inspection and you find the

people on the ground that you find non-compliances. But the cause, the root cause of the analysis of those non-compliances is quite upstream relative to budgets, time, organizational attention, and sort of dealing with the downstream issue isn't necessarily going to fix the big picture.

So how pragmatically and practically, given this trend which is concerning and needs to be reversed, how do you deal with those upstream issues that are related to these non-compliances based on your analysis?

MR. MOSES: Colin Moses, for the record. So in the case study they represented in the medical sector, we talked about the evaluation that we conducted, and this was actually, as an aside, quite an innovative application of the evaluation methodology. Typically, evaluations are used to look internally at the effectiveness of government programs.

In this case, we actually put the focus externally, so that we could gather some real data from the RSOs on the challenges and the difficulties that they're having in designing and managing the programs that they use to ensure workers are protected.

So that evaluation has been concluded. We

provided a report on the evaluation at the Commission last year, and it's actually just recently been posted on our website, which delves into the details of the challenges that the RSOs are facing in managing their day-to-day work. Because the realities in the medical sector is that it is a difficult, it's a challenging environment, workers are stressed and busy.

There's a high focus on patient safety, sometimes to the detriment of workers, which goes against what our concern is and our priorities are to keep those workers safe as well.

So maybe to speak to some of the work that we're doing to provide additional guidance on the design and implementation of the radiation protection programs, I'll let Ms Natalie Ringuette speak to REGDOC-1.6.2.

MEMBER DEMETER: I understand all the work that's been done on the identification and what's been posted. I was wanting to see if there was some pragmatic way forward to influencing, not just identifying the issue from the RSO point of view, but influencing the behaviour of organizations, if they're the root cause, to better support the RSOs.

Because, yeah, we can identify all that, but if we keep looking at the RSOs and their concerns

without pragmatic ways of influencing those above them or the organization, I'm worried that the trend won't change.

So I understand what's been published and that you've done this analysis and you've heard the concerns of the RSOs, and I want to sort of see next steps on actual operationalizing that to how are you going to influence those organizations to better support the RSOs?

MR. MOSES: Colin Moses. I quite agree with that. In fact, our focus is on the leadership, to make sure that the RSOs who are by and large a very dedicated and committed community, but need organizational support to be able to be successful.

So I'll let Mr. André Bouchard maybe speak to that a little bit.

MR. BOUCHARD: André Bouchard, Director of Inspection Division, for the record.

This is a pretty timely question. Two weeks ago I was on an inspection trip with an inspector in an area of our territory. We knew coming to it that there was already some symptomatic issues with those hospitals we were visiting.

Our strategy to come into those inspections was actually to meet with the people responsible for the licence, which are higher people in the

org charts that have capabilities of decision making, on resources, and money as well.

Our entry point was to let them know that we were doing these inspections and would actually feed the information back to them.

What came through during the inspection obviously is we could have gone into details and addressed the RSO's lack of doing performance things. Well, our questioning and our review shows that the RSO was not given any time to perform their tasks, and they were asked to focus on patient safety. There's good reasons for that. There's a substantial shortage of people's power in those areas and we needed to recognize that.

So we sat with those in authority and discussed ways that they could actually still maintain the program without sacrificing the RSO's and the special technicians' time to do these tasks.

So we've opened up on a discussion, as an example, to use other people in the department that are not registered nuclear medicine technicians to perform some tasks and explain to these people that the concerns of the CNSC and the primary area is that the people are competent in doing the work that they do, but they do not need to be nuclear medicine technicians.

That opened up all kinds of interesting things, as well as a discussion to help different hospitals from one place to another. The help might not be local, there are ways that they could back-up each other as well. We also discussed having strategies too so that they could actually open up their horizons to do better and recruit people and keep them, which is the heart of the matter.

So we went to, what you were saying, is there are program issues, there are staffing issues, there are also org chart issues, because unfortunately the person that was responsible for that RSO and the work assignment had no understanding of the radiation protection, they were in another department focusing on other priorities.

We also had an interview with her and let her know, that person, that they needed to spend some time caring for the program and making sure that there were allocations to the program.

So it's a long explanation, but I think a good example in the ways that we could actually target the RSO or go higher and go to the root cause of the issue.

MR. MOSES: Sorry, if I could just add too. In the implementation for REGDOC-1.6.2 we're looking at those interconnections, we're looking at the responsibilities, we're looking at the make-up and

structure of the radiation safety committees in the design of those programs to ensure that those issues that we know need to be addressed, they're being implemented in the design of the program right upfront so that the RSO has a support network that they need to be able to succeed.

MEMBER DEMETER: Thank you. I hope the trends change. Thank you.

MR. LEBLANC: Any additional questions from the Members? Dr. Lacroix.

MEMBER LACROIX: Yes. I would intervene on this question. You provide us with a number of reasons for the declining performance in the medical sector as well as the industrial sector. I was wondering, isn't the problem deeper than that in the sense that could it be a problem of culture of radiation protection?

MR. MOSES: Colin Moses, for the record. Yes. If you look at the root of some of the challenges in the more broader programs, there's indications of worker non-compliance with procedures, which is why you focus on the performance-based inspections, lack of management oversight, lack of internal audit programs. So those are factors that really come into the overall safety culture. And so we've actually been actively promoting the use of the regulatory document that the CNSC has developed on

safety culture and encouraging licensees to apply those principles.

In fact, we even launched a pilot at Isotope Production Cyclotrons to use a tool that allows inspectors to provide some concrete feedback on their observations and how they link to the maturity of the safety culture in the organization and share that with the leadership in the licensee's organization so that they can actually address those root causes rather than just focussing in on the specific non-compliances.

MR. LEBLANC: Any more questions? If not, we're going to move to the next submission which is from the Canadian Environmental Law Association or CELA as outlined in CMD-19. M 29.3. Any questions from members on this submission?

Doctor Berube?

MEMBER BERUBE: I'm just looking at the CELA submission on page -- I guess it's page 13 under International Obligations, and CELA has asked it if it possible to actually make reference to international standards groups in some of our presentation material. I'm not sure if that's a practical thing or how difficult that would be to implement. Maybe give me some feedback on that?

MR. MOSES: Yeah, so I think there is an interest with looking at the alignment with the international standards, and certainly with the recently hosted International Regulatory Review Service Mission to Canada. That was a particular area of focus of that mission to look at how the CNSC, our practices, our approaches, and our frameworks align with the guidance and the requirements that are provided by those international standards.

I think practically the key area of focus for us is looking -- that is really addressed during the design and development of those regulatory instruments, and then when we're reporting on licensee performance and our oversight thereof, it's against the requirements and the guidance that we've established domestically, and so that's typically how we dialogue and how we describe the work that we do, notwithstanding, I know, as we develop new regulatory instruments in the regulatory documents there is linkages as appropriate to those international standards that we embed for additional reference and additional information.

MR. LEBLANC: President Velshi.

THE PRESIDENT: The intervenor talks about the revised inspection strategy and maybe it would be

helpful if you just elaborated a bit more around the inspection strategy and shifting the focus from the high risk to the medium risk along with these other considerations that you spoke about, and what are the risks associated with -- with doing so? And so that's one; there are a few parts to my question.

The second one is, more inspections means more non-compliances and that correlation between the -- the level of oversight with a number of inspections and how would that change; and, you said, you know, these other inspections, field inspections, take more time. That probably means fewer inspections. And then just because you see fewer non-compliances, has performance really improved?

And the third part is, when you do your inspections and we heard from some of you some are planned inspections, some you just kind of show up; what's the correlation between those and the non-compliances that you see, whereas, if you give them forewarning they are kind of prepared for you and have cleaned up their act?

MR. MOSES: Colin Moses, for the record.

So maybe I'll actually address those in reverse order, if you let me. So, the impact between planned and unplanned and licensees actually cleaning up

their act before we go, that's not a bad thing. So, an announced inspection means that a licensee will do a more comprehensive review of their program, they'll identify -- self-identify their challenges and issues and they'll make those corrections to the program, and so just because they know we're coming and because we know that they do work to -- to sort of prepare for our arrival, our objective of compliance is about having compliance with our requirements -- our objection and inspections. And so you know I think that is a positive impact, even just the fact that we say, Hey, we're going to come look at you, that already has an impact even if we end up not -- or, moving to other priorities.

But, of course, there is, you know, if you don't allow them that time to do that self-review it's natural that you will discover more, or you're more likely to discover some of the minor non-compliances or things that they might have gotten cleaned up through that preparation.

So, maybe I'll as Ms. Lucie Simoneau -- and don't forget to put on your earphones too -- to speak to sort of how we approach the different types of inspections, and also how that impacts our observations through those inspections.

M^{me} SIMONEAU : Lucie Simoneau.

Lorsqu'on fait des inspections qui sont annoncées et planifiées, le titulaire est avisé deux ou trois semaines à l'avance, et généralement, ce type d'inspection là va vraiment focuser sur... justement, le titulaire a le temps de se préparer, puis on va focuser sur la révision de la documentation. On va aussi vérifier les entreposages, les doses, puis on a généralement plus de temps avec le titulaire. Donc, il est disponible pour nous pour faire toute la documentation. Et, par la suite, on va faire une portion d'observation, si possible, quand on peut.

Alors que, de l'autre côté, quand on fait des inspections qui sont non annoncées, elles sont généralement planifiées, on sait qu'on va y aller, mais dans ce cas-là on va vraiment plus focuser sur l'observation des travailleurs. Donc, on ne va pas interférer dans le travail des responsables de la radioprotection, on ne va pas interférer dans le travail des technologues. On va les regarder appliquer leurs procédures internes, et c'est à ce moment-là qu'on vise justement la sûreté. On vise le fait qu'ils vont appliquer leurs procédures qui sont inscrites dans leur manuel. Donc, quelque chose que le responsable de la

radioprotection n'a peut-être pas le temps de faire sur le day-to-day, nous, on va focuser sur vraiment tout ça et à la fin de l'inspection, on va donner le rapport d'inspection, mais on va aussi regarder certains documents comme au niveau de la formation ou des doses. On va vraiment sur qu'est-ce qui est, pour nous autres, jugé de haut risque au niveau de la documentation, de qu'est-ce qu'on veut absolument voir, et le reste va être sur les observations.

On peut aussi demander après l'inspection d'avoir... au responsable de la radioprotection de nous fournir un certain nombre de documents pour qu'on puisse avoir un aperçu global de la gestion du programme de radioprotection.

Est-ce que ça répond à vos questions ou...?

THE PRESIDENT: Not fully, because what I really want to get at is what's the correlation between your findings and whether it's announced or not as we look at non-compliances. So, if you show up at short notice and you see, well, they're not wearing their dosimetry or they're not doing their checks on their gauges before using, or whatever it is, as opposed to whether they've had time to clean up and get a refresher and so on, do you

track that, and can one just see what the impact is?

MR. MOSES: Colin Moses.

So, before I throw it back to Ms.

Simoneau, I think it's also relevant to look at the types of inspections that we do typically more unannounced versus announced, and so the announced inspections are generally ones where we're going to the licensee's location, we're meeting with the RSO, we're looking at their overall program implementation, there's some documentation verification embedded with the performance observation.

Generally, unannounced are more looking at field observations. So, that's exactly the kind of things we're looking for: Are the workers trained; do they have the appropriate certificates; do they have dosimetry, their serving meters, as appropriate; and, are they doing the necessary maintenance checks; and, so those are good indicators for the overall health of the program.

And then the other more location-specific inspections are looking at the maintenance of their program.

And, so I don't know, Ms. Simoneau, did you want to --

THE PRESIDENT: Yeah, but you haven't answered my question. I understand exactly what you're

saying. But it's - the question is, if I looked at one of your charts that shows all these non-compliances that you have seen, have they come from the -- you know, the quick show up and -- or, are they from the more planned ones?

MR. MOSES: Thank you. Colin Moses.

Yeah, and you're entirely correct. No, so, like the way we track our data is really rolled up into the broader performance data, so the linkages we can have between the different unannounced and announced are really anecdotal based on dialogue with the inspections and what we see.

Right now we're not distinguishing in the analysis of the data whether that was something that was discovered. But those anecdotal input has -- has been what has driven our focus on more performance based, more field inspection because the inspectors were seeing those observations in the field, and so we knew that that was where those non-compliances were happening.

THE PRESIDENT: And then just from a level of effort, what percentage of the inspector's time would be on doing the short quick checks versus the longer-term planned ones?

M^{me} SIMONEAU : Lucie Simoneau.

Je vous dirais qu'en tant que... Oh,

excusez.

En tant que différence de temps, ce n'est pas très, très différent. Qu'on fasse une inspection d'observation principalement dans un département de médecine nucléaire ou qu'on fasse une inspection où on va observer les travailleurs, le temps d'inspection va être relativement le même, parce qu'on n'a pas... Si on faisait les deux en même temps, ça prendrait une journée au complet.

Donc, pour ne pas abuser, je vous dirais, on fait soit la documentation ou soit les observations, et probablement que la seule différence qu'on fait avec les... qu'on voit avec les inspections non annoncées, c'est plus, je vous dirais, un peu où on va avoir une personne ou un hôte qui va moins suivre les procédures par rapport à une autre. Mais au bout du compte, probablement qu'on soit annoncé ou non ne fait peut-être pas tant de différence que ça.

MR. MOSES: Colin Moses.

Then, just to finish answering your question, in terms of -- I'm not sure that we necessarily have the data that could say, you know, of our total eight hundred and some odd inspections this portion is unannounced and this portion was not. But we do, in our

annual planning, look at sort of specific inspection strategies or campaigns that we want to embed in the annual planning, and that's largely informed by the observations from previous years. So, that's one of those factors that we have introduced into our annual planning cycle, to look at whether this year we want to prioritize a certain area, a subsector, or type of inspection or not.

But, one of the things we have done in this year's update of our program management and planning cycles is to build in a good amount of space, about 30 percent of our inspection campaign, to allow for that reactive work. So, when we see an event or when we're seeing trends then we can divert those resources and actually embed that into our annual planning to address that.

THE PRESIDENT: Thank you. It was that 30 percent that I was trying to find out. Thank you.

MR. MOSES: And you had two other questions. So, the first one was around you know that shift from high to medium, whether it had an impact. And so you know moving some attention to the medium sectors because that's where we think we really need to put our attention doesn't mean we totally ignore the high.

So for example, previously we, in our

annual planning, we prioritize the high risk activities, so that's industrial radiography and those types of activities, and ensure that we go to every location of every licensee at least once annually.

And so part of what we've done is we've looked at sampling of licensees, so if they have 80 locations we'll sample and see if there's bigger issues that need a more broader campaign. And so that allows us to spend more risk informed time on where we think we can add that value as compliance inspection. So, it doesn't mean we totally ignore those.

But, also, if you look at the trends, I mean, when we did the -- I'm going on a bit of a tangent, so I apologize. But, when we did the case studies, the one -- the third one that we had thought about including -- but because it's more historical -- was in the industrial radiography sector. And so that is a high risk sector, but that's one that in the early 2000s you heard earlier around sort of exceedances of 100 mSv etcetera in that sector, we were quite concerned, as a regulator, with the level of worker doses that we were seeing in that field and implemented a number of measures to really drive that correction in performance, including the renewal and the implementation of PCP-09 for certified exposure device

operators, as well as a transition to field base inspection for those licensees, and the establishment of a working group to directly engage with the industrial radiography licensees to dialogue around the challenges they're having and how we, as a regulator, can influence their performance. And so that trend we have seen really strengthened in that community.

It's still a high risk application; the worker doses are still higher than other areas, but we're reasonably confident that they're at a stability level as opposed to a declining level which allows us to move. But that doesn't mean that's where they will be three years from now, and so we're constantly looking at how we need to re-tool and adjust our programs.

And then the last point was around, you know, more inspections, more non-compliances; less inspections, less non-compliances. And so we do less, we see less, and therefore we can say everybody is doing better. So, that's why when we look at the performance trends if you look at the data that we provide in the regulatory oversight report it's actually based on percentage of observations. So, we're not saying you know number of the 30,000 verifications that we do on an annual basis, it's not a hard number; it's a percentage of

inspections. So that helps to normalize the results. It's not a perfect system, but that's certainly how we try and manage that concern.

MR. LEBLANC: Any further questions?

No.

So, Madam President, would that be a good time for a break before we go to the general rounds of questions?

THE PRESIDENT: Yes.

MR. LEBLANC: So, ten or fifteen minutes?

THE PRESIDENT: Ten minutes.

MR. LEBLANC: A ten minute break. So we'll resume at 11:00.

--- Upon recessing at 10:52 a.m. /

Suspension à 10 h 52

--- Upon resuming at 11:04 a.m. /

Reprise à 11 h 04

THE PRESIDENT: We're ready to resume the meeting.

We'll start off with the round of questions from Commission Members and we'll start with you, Dr. Demeter, please.

MEMBER DEMETER: Thank you.

This is more of a detail question based on Figure 25, which deals with doses to nuclear energy workers in the medical sector by subsector. Normally, nuclear medicine technologists have a higher exposure to low dose, whereas radiation therapy technologists work around sort of higher dose situations and have much lower dose profiles, but there was one that had a dose of greater than 20 and less than 50 mSv in the year. I just wanted more detail about what that incident was and how they got exposed, because the risk of exposure in that industry is they are exposed it can be quite high compared to nuclear medicine.

MS MORTIMER: Sandra Mortimer, for the record.

This was -- as we mentioned at the beginning of the presentation, there were some errors in the dose data that were found and this was one of them. This was actually an indication where the licensee in their initial report had indicated a dose at a level that was higher than really received by the worker. So when we did a review in trying to answer some of the questions that were raised in the interventions around the dose data, we found that this was a data entry error for this particular licensee and they were not at that level.

MEMBER DEMETER: Okay, thank you.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: Thank you.

I've noticed in the submission that CNSC lab holds two licences, one for a gamma irradiator and another one for the use of nuclear substances, and I was wondering who regulates the regulator in this case. In other words, how does CNSC avoid the shoemaker's children to go barefoot?

MR. MOSES: Colin Moses, for the record.

So the short answer is we regulate the regulator and it's specifically chosen that way because we can establish that Chinese wall between the operations of the lab under their CNSC licence and the regulatory oversight in the Directorate of Nuclear Substance Regulation.

So maybe I can ask Mr. Sylvain Faille to speak to the licensing and review the program.

And we do have actually the representatives of the lab if you're interested in hearing from the licensee in this case as well.

MR. FAILLE: So in order to make the separation, the way it works is typically the lab would be considered like any other licensee. So they have their own

applicant authority. There's a Radiation Safety Officer assigned to the lab and he's the one dealing with our group for the licence itself. And if we need some assistance from specialists, we would use specialists within the same group, but it would be different than the one assigned to the lab, if there's some evaluation being done. So there's a separation there also within the specialists who are doing the review for us versus the licensee as the lab. So that's how we're trying to maintain the separation between licensing and the licence itself.

MEMBER LACROIX: Thank you.

THE PRESIDENT: You didn't want to hear from anyone in the lab?

Any non-compliance issues that we should be aware of from the lab?

MR. MOSES: Colin Moses, for the record.

So not this year. There have historically been some challenges in the program and that has led to some revisions of the program, but, to my awareness, this year there was nothing in specific that warrants highlighting.

THE PRESIDENT: Thank you.

Dr. McKinnon.

MEMBER MCKINNON: Thank you.

I guess as a regulator you want to identify factors affecting compliance and also look at the effectiveness of the enforcement methods, and in the graphical analysis you've done that to some extent. But reading through the ROR, it struck me that you have a huge amount of data. There's like 1,000 -- or almost 1,000 inspections were done in 2018 and if you include previous years you've got many thousands of data points. So I was wondering if you have done any detailed statistical analysis. This seemed an area to me that would be just beautifully set up for something like the new machine learning techniques. You could extract a lot of very useful quantitative correlations and, you know, dig a lot deeper. Has anything like that been done with further analysis?

MR. MOSES: Colin Moses, for the record.

I absolutely agree with you. I think our work is very conducive to that type of analysis. We collect upwards of 30,000 data points through our compliance inspections. To date, with the systems that we have and the way we collect and record our data, it's still a fairly manual exercise. So Sandra and her team pull together all the observations, look at trending, look at common areas of non-compliance.

But it is actually an area where the CNSC is exploring how we can better leverage some of these new tools like machine learning and artificial intelligence. In fact, we're also looking at how other regulators have used that kind of data. There's some very interesting case studies even for examples of food safety and monitoring public tweets of illness in San Francisco, and so some of those applications have a potential to be leveraged here.

And so we are connecting in with the community of federal regulators to look at practices of other regulatory bodies and how we can use and leverage those tools to inform. But it does mean we need to invest in the systems that we have, we need to invest in the way we collect and record data so that it's in a format that can be easily manipulated and used by these kinds of tools.

And so that has been a big focus of our improvements in our systems this year, to set the framework, the foundation to allow us to explore how we can use these tools in the future.

MEMBER MCKINNON: Thank you.

I would just like to follow up with a related question on the data. Because in one of the slides you showed that there was a -- at the point where there was a change from records to performance-based, there was

actually a change in the compliance, and there were other instances of where something in the underlying measurement, the way you had measured had changed and so had the response. So, you know, the question here is, if you look only at the statistics you might interpret something, but the question is, how do you know if you changed the underlying behaviour? So is that something that you look at?

MR. MOSES: Colin Moses.

So the advantage of doing this report or at least the analytics of the performance on an annual basis is we can form hypotheses, adapt our approach, test those hypotheses. But you're absolutely right, it's very easy to fall into the trap of just looking at a line and the direction it's moving and make assumptions of the trend in performance.

I'll give you a very specific example of that. In the security of radiation sources we recently implemented a new REGDOC, REGDOC-2.12.3, which laid out new specific security requirements for the security of sealed sources. That was rolled out in a two-phased approach, with a particular focus on the higher sources, Category I and II first, and then just recently, in 2018, came into effect for the Category III sources, which are at a

slightly lower level of risk.

And so what we saw in the Category I and II sources is we actually did an inspection campaign post-implementation to evaluate the licensee security measures and of course, because the expectations and the requirements changed, the number of non-compliances that were detected increased and so that would suggest that performance of licensees is actually declining, where there's actually more a correlation with the changing requirements and their gradual implementation of those requirements. But those were all initial corrective actions. So once we discovered a non-compliance, the licensee implemented corrective actions. The next time we go back those aren't detected and so you start to see that upturn.

With the implementation of the Category III sources, because we had that experience in the Category I and II, we actually did much more proactive communications with licensees. We did a readiness inspection, so looking at, you know, giving feedback as recommendations that you're okay now with our requirements, but when this comes into effect, these are some changes you need to make to your program. We actually proactively brought those licensees back into performance before it

became actual non-compliances with the requirements.

So that kind of feedback we do try and take into account as we adapt and adjust our inspection focuses. But I shouldn't lose sight, the anecdotal input that comes from the inspectors who are in the field every day doing inspections every day is incredibly -- is still incredibly valuable to inform where we focus our efforts in future years.

MEMBER MCKINNON: Okay, thank you very much. Just to clarify one point that you mentioned. When you make a change, you communicate that very clearly to the licensees before you do the new inspections on that basis?

MR. MOSES: Colin Moses, for the record.

Absolutely. And with every new change in requirement there's different implementation strategies and those are communicated to licensees well in advance. So yes, that is a big part of our focus. Because, as I alluded to in our presentation, with us the challenge is sometimes just getting the attention of the licensees, because their focus and their business is in bigger or different areas rather than just the radiation safety, and so we are really focused on our outreach activities in actually engaging and connecting with those licensees to make sure they're aware of the changes that are coming.

THE PRESIDENT: Thank you.

Dr. Berube.

MEMBER BERUBE: Yes. I want to get into some of the performance metrics. You're looking at Slide 46 when you're looking at your historical low performance metrics. I'll just give you a second to get there.

But as we were just talking about basically, looking at the dataset here, one would very quickly draw a correlation between the employment of AMPs and actual performance. Irrespective of the sampling methodology that you've used here, it's very clear that basically increased AMP performance leads to compliance immediately, irrespective of what type of inspection that you're employing, based on this data here, based on this trend analysis.

If we move into the medical sector and we look at the academic sector, we're having some problems with compliance and mostly it's institutional issues which you're concerned about, right, and I understand that there are institutional issues with this. Having come from that background myself at the executive leadership side of it, I can tell you that most information doesn't necessarily get to the people that are the key decision-makers.

So should you decide that you have to

employ other means, punitive means in order to get assurance, understand a couple of things. First of all, every hospital that you're dealing with is a separate corporation, so they're run by a CEO, they have a Board of Directors, and fundamentally you're not dealing with a whole systemic organization, although it's funded that way, you're dealing with a privately run basic organization. So fundamentally, if you're going to drop an AMP, for instance, drop it on the CEO's desk with a detailed description of where the problems are and why they're there and why you think they're there. Don't go middle management because that will get buried in the bureaucracy, which happens very, very quickly in these kinds of institutions for some reason.

I just wanted to bring that to light because I want you to understand that's the nature of the way this is organized.

The other question I have is the medical sector in general, is this a national thing that we're seeing or is this more regionalized? I don't want you to point fingers at any particular province, but fundamentally is it a bigger problem in some areas than it is in others or are we seeing it widespread?

MR. MOSES: Colin Moses, for the record.

So certainly, just to address your first point, we understand the impact of engaging with the leadership and do recognize that often the people who are accountable for the day-to-day management of the radiation safety are several layers below the decision-makers in terms of priorities and management focus. So, for example, when we issue administrative monetary penalties, we issue those to the applicant authority, not to the Radiation Safety Officer, and so the call that I make in issuing that and the pushout of that goes to those senior leaders in the organization.

The other thing we shouldn't lose sight of is we do also have a practice of posting all regulatory actions on our website and so because that then becomes in the public eye, that has a huge impact on the management focus and the executive attention on those files.

With respect to national and regional, it is a trend, to my understanding, that we're seeing across the board, but it's exacerbated by some, typically, changes in governance structures or organization of the hospital oversight bodies. A number of provinces moved to more regional coordination and regional management of hospitals, and because you're then sort of pulling the programs a step further away from the day-to-day workers, often what we'll

see is inconsistent application of the requirements or inconsistent performance of the program. And so it does tend to be sort of focused in those areas that have gone through those governance changes and that's to be expected as, you know, when change happens, there's always a sort of dip and correction in terms of performance or even just sort of compliance with the procedures and those sort of things.

And I would also just ask Mr. Bouchard. I don't know if he wanted to speak anything further on that point.

MR. BOUCHARD: André Bouchard, for the record.

Mr. Berube is right, there's a slew of reasons that we're just seeing the impact, some of which, as an example, in some regions there's just a shortage of qualified people, they're not going back. It's the same problem throughout the whole medical profession. So nuclear medicine technicians is just one of those things to be considered.

There are some -- from my perspective, we can see that health is being run provincially and we see flavours throughout the country of that effect. We can also see the point of aging population in certain areas of

the country as well as having younger demographics in other ones, which kind of changes the impact on the health system as an overall issue.

Some issues are local. As an example, we can see in the area of Toronto private clinics bring a different flavour in the way that things are managed and the way that they are staffed and run, and we need to adapt to those problems, that they are there as well, which are not necessarily in other provinces where the whole system is run by the government.

So you have a point there where our strategy needs to be tailored to the area that we regulate with that dimension, whether we're handling with the public sector or with the private sector.

THE PRESIDENT: Thank you.

Dr. Demeter.

MEMBER DEMETER: Thank you very much.

This is a question related to sealed sourced and portable gauges. The USNRC has gone to sort of a national registry database and, that way, sort of keeping track of all the devices out there. Is that being contemplated or discussed in the Canadian setting, to have a more database approach to sealed sources and portable gauges?

MR. MOSES: Colin Moses, for the record.

It's interesting you actually point to that. When we had the IRS mission, one of the feedback points that we got is to look at different approaches to our authorization practices around different types of activities. And so in Canada, under the NSCA, and our approach right now is a licensing approach, so a registration process isn't necessary because we get that information through the licensing and we're tracking and recording inventories on an annual basis, and as well we have systems to track the location of all high-risk sources in Canada.

However, one of the things the IRS pointed out is that there's other authorization tools or approaches that we could explore using for some of the lower risk. And so a registration approach is more of a "Here is a standard to which you must adhere and tell us when you acquire these devices" and more of a reactionary approach, and we would be very uncomfortable doing that for higher-risk applications. But for some of the lower risk we're sensitive to the burden that we put on the regulated community and the expectations that we implement through a licensing process. And so there is an opportunity to explore different authorization schemes and a good way to

test or judge those is to look internationally at the practices in different countries.

It's one of the areas we're exploring. That would require some fairly substantive changes to our regulatory framework, but we've actually addressed that indirectly through simplifying licence application expectations, modernizing our -- or simplifying our inspection focus to focus on those high-risk applications so we can mitigate that burden without actually moving to a full registration scheme.

Did I answer your question?

MEMBER DEMETER: I appreciate the stratification of -- the intensity of bureaucratic or administrative burden on licensees based on the risk of their sources. So I was thinking the higher-risk portable gauge industrial sources garner sort of more attention. I appreciate that. Thank you.

THE PRESIDENT: A question for you. How do you measure how effective you are with your oversight?

MR. MOSES: Colin Moses, for the record.

It's a question with a whole bunch of different dimensions. So some of that we explored in this regulatory oversight, where we've sort of changed our approach and then we can see what kind of impact that has

on the performance of the industry. And so those -- sort of that's the number one approach.

The other thing we do every five years, we actually crack open our sort of foundation for our regulatory oversight strategies to look at have performance trends changed; are there new applications that are seeing increased use; do we need to retool our requirements or our approaches or areas of focus. And so by looking at that relative risk ranking of the different use types and actually integrating those factors that can influence the performance of the licensee, we're looking at whether our program is still appropriate and effective at addressing sort of the dynamics of performance that we're seeing on an annual basis. So that is an exercise that, as I mentioned, we do every five years.

This year we've actually integrated that human resources element as well, to make sure that we're making risk-informed decisions on where we put our focus, our regulatory focus and our regulatory efforts and that we can be responsive to those changes in industry populations and whatnot.

So I hope I answered your question, I mean --

THE PRESIDENT: Yes, you have. I mean,

because one simply looking at the licensees' performance would say, Well, performance is declining, clearly not terribly effective at oversight. But you know, how do we say, well, the oversight is all these other things, and here's how we -- you know, there's some correlation, but really not. It's -- yeah, I just wondered how -- what story one tells.

MR. MOSES: And another tangent, for what it's worth, but one of the nice things about our work is because we have that high level population, we can actually explore the impact of different tools. So in the fixed gauge sector, typically it's a very -- it's a medium risk, but it's fairly low risk in terms of the risk associated with those activities, because those gauges are installed on vessels or piping and sit and beam radiation with limited exposure.

But there are certain high-risk activities, so for example, a number of vessels require periodic cleaning, which has workers enter those vessels. And in licensees' space, they have very robust health and safety programs around confined space entry. But what we had observed is sometimes they forget that there's a hazard or an energy that isn't typically embedded in confined space, which is a radiation hazard.

And so we're actually just in the process of finalizing a message that's aimed at the CAOs or the applicant authorities of the fixed gauge licensee who have those vessel entries. And we're leveraging some nudge techniques, so behavioural insights in terms of how to have a bigger impact on licensees and bring that management attention so that they ask the questions of their staff on how they're performing against these requirements.

So we try different tools and then we can measure and see what the results are through our inspections.

THE PRESIDENT: Thank you. And not wanting to wait until next year, what does 2019 portable gauge results look like with the -- you know, with the case study and the intervention? Just general direction of -- are we still seeing the improvement?

MR. LAFLAMME: Mathieu Laflamme, for the record.

So we're still midway through our current inspection plan. But right now, inspection results for the portable gauge licensees that we have seen are still well performing. And this year we've actually issued fewer orders to portable gauge licensees compared to the previous year so far.

THE PRESIDENT: Thank you.

Dr. Lacroix?

MEMBER LACROIX: This is a question concerning the metal recycling industry. I've read that they have the responsibility to report the detection of radioactive material to the CNSC. But this sector, from what I understand, is not under a licence from CNSC. So how do you know that they will report the detection of radioactive material? How do they know, do you know that they have the proper equipment, the property radiation detection to find out about this radioactive material? And are you aware of other sectors that could be exposed to radioactive material that are not under a licence from CNSC?

MR. MOSES: Colin Moses, for the record.

So before I turn it back to Karen Owen-Whitred to speak about our requirements and where we actually embed those, so you're right, we need to look at where we apply and how we apply our requirements. So when we issue a licence that includes conditions, so for licensees we can apply those requirements. For the sectors that don't require licences that aren't licensed, we leverage the regulations.

And so the advantage of regulations is the

requirements of general application. And so in the packaging and transport of nuclear substances regulations, we have specific requirements around notification that are applicable to all Canadians.

And maybe Ms Owen-Whitred could speak to some of those requirements.

MS OWEN-WHITRED: Karen Owen-Whitred, for the record. I'm the director of the Transport Licensing Division.

What I would want to add to what Colin has already said is just quite specifically with respect to CARI, which is the Association for Recycling Industries, we do have an extensive outreach program directed specifically at that industry. So we have, for example, attended their annual meetings in order to make sure that we spread the word as widely as possible across that particular community to make sure that they are aware of exactly the obligations that you've already referenced.

MEMBER LACROIX: Are they required to have a radiation detection on site? Is it the law?

M^{me} SIMONEAU : Lucie Simoneau.

Si vous voulez mettre vos écouteurs.

Plusieurs entreprises de recyclage de métaux ont des détecteurs de métal... de radioactivité sur

les portiques à l'entrée où les camions vont passer avant de décharger. C'est, je vous dirais, de juridiction provinciale. Au Québec, c'est obligatoire parce que le ministère de l'Environnement a jugé nécessaire d'imposer un... Comme au niveau de l'enfouissement, c'est une limite zéro au niveau radioactif. Donc, tous les sites d'enfouissement et, je vous dirais, la grande majorité des sites de recyclage ont des détecteurs de radiation à l'entrée, et c'est aussi au bénéfice de la compagnie, parce qu'ils ne veulent pas avoir à gérer des contaminants radioactifs par la suite dans leurs entreprises. Donc, ce n'est pas de juridiction fédérale, mais souvent provinciale.

MEMBER LACROIX: And one quick question, snap question.

Est-ce que ces détecteurs peuvent détecter le rayonnement alpha?

M^{me} SIMONEAU : Pas à ce que je sache. Généralement, c'est vraiment du gamma, de façon générale.

M. MOSES : Si je peux aussi mentionner. Un des événements qui est rapporté dans le rapport cette année, c'est la détection d'une jauge fixe. En effet, cette jauge est un émetteur d'alpha. Ça fait que ça n'a pas été détecté par les... the border, the entry

protections. But because of all the awareness campaigns that we've worked on and we've published posters that we've circulated to the metal recycling industries, there's a broader worker awareness of those hazards.

They don't present an immediate risk in terms of sort of worker health and safety protection because they're within fixed and shielded containers. But those -- we don't want those entering the broader metal recycling stream. And so because of the markings on those gauges that are required through our *Radiation Protection Regulations*, that was actually identified and brought to our attention so that we could take possession of that and ensure appropriate disposal of the nuclear substance.

THE PRESIDENT: Okay. Quick last round.

MEMBER LACROIX: Thank you.

THE PRESIDENT: Dr. McKinnon?

MEMBER MCKINNON: Comment as much as a question. When in reading the ROR, I particularly enjoyed reading the case studies and the regulatory intervention, because it gave me a lot of insight into the thought process, not just the numbers, and some of the issues you deal with, you know, when you are regulating sectors which are quite different in their nature.

So it struck me that, you know, you

probably learned a great deal of lessons from the various changes that you made in dealing with the different sectors. And you know, I was curious how you were capturing that, but that was my original question. But then I saw in the presentation, there is REGDOC-1.6.2. And is that the purpose of that REGDOC, to capture that type of experience?

MR. MOSES: Colin Moses.

So maybe more generally, certainly, the regulatory framework and the requirements that we apply through licensing are periodically reviewed and adapted to address the observations that we're seeing in the field.

But maybe just to speak to the broader objective of REGDOC-1.6.2 I'll turn it to Ms Natalie Ringuette, who's leading the development of that document.

MS RINGUETTE: Natalie Ringuette, for the record.

The intent of the REGDOC-1.6.2 is to provide guidance to licensee. We have a licence application guide 1.6.1 that asks the licensee to submit all this information in order to obtain a licence. However, we didn't provide guidance as to what kind of information we're looking in a radiation protection program. So this new guide will provide a little bit more

information as to what the licensee needs to do in order to have an effective radiation protection program and also how to effectively implement that radiation protection program to assure that they comply with regulatory requirement and to also ensure that there's no non-compliances that develop from the licensee's operation in implementing that program.

MR. MOSES: And just to give some very specific examples, so embedded in that REGDOC we've given some additional guidance on the makeup and structure of radiation safety committees. Because what we were seeing in the field is we had the requirement to establish a committee, but in some cases a membership really wasn't appropriate or representative of the people who should be providing that high-level governance oversight. And so we've added some additional details in terms of what's an appropriate makeup, who should be involved, the levels of participation and whatnot.

We also heard through the evaluation that there was a lack of consistency in terms of the amount of effort that's allowed to an RSO to perform their radiation safety duties. And so we've included some general awareness guidance. It's very different, depending on the scope and breadth of the program, but at least building that awareness when you're designing a program that you're

thinking about, How big is a program? How many workers? How many locations need to be managed? Is one RSO sufficient? Should there be site or regional RSOs with an overall accountable RSO for the whole program? And so we've added some additional details around that because of the inconsistencies we were seeing in the field.

MEMBER MCKINNON: Okay, thank you. I'm really glad to hear that, especially in view of the discussion earlier, Dr. Demeter's question and Dr. Berube in terms of, you know, not only dealing with the radiation safety officer but the entire, you know, higher level organization as being instrumental in part of, you know, successful execution.

Thank you.

THE PRESIDENT: Dr. Berube?

Dr. Demeter?

Okay. Well, thank you very much for a really good discussion on the ROR.

CMD 19-M41

Written submission from CNSC staff

THE PRESIDENT: So we'll move on to our next agenda item, which is the Event Initial Report

regarding an exposure above regulatory limit of a non-nuclear energy worker, as outlined in CMD 19-M41.

And Dr. Peter Petric from the Provincial Health Services Authority is joining us via WebEx and is available for questions.

So Mr. Moses, over to you again. Anything you wish to add before we move to the questions?

MR. MOSES: Colin Moses, for the record.

So I'll just let my colleagues get settled as I start.

Just to give you a general overview of the event initial report. So we are here to bring to your attention the report that relates to a dose assigned to an individual that is above the regulatory limit.

In May 2019, the CNSC was advised that a dose of 1.85 mSv was recorded on an employee's dosimeter during the period between January 1st and March 31st, 2019. That employee is a radiation therapist. And as we spoke to earlier, given the occupational exposures are typically very low, they're not actually designated as nuclear energy workers. And so as such, the applicable dose limit is the annual effective dose limit of a member of the public or a non-nuclear energy worker of 1 mSv per year, and therefore, the exposure of 1.85 is considered an exceedance of a

regulatory dose limit.

An exposure at this level has no health effects. Further, the licensee investigation does suggest but could not confirm definitively that the exposure was a non-personal exposure, which means the dosimeter was exposed, but that dose was not actually received by the worker. And so as a result, a CNSC-designated officer did approve the worker's return to work on May 17th, 2019. And CNSC staff have concluded that the licensee took the appropriate measures following the discovery of this exposure.

And we remain available to answer any questions you may have.

THE PRESIDENT: Okay, thank you.

So we'll start with Dr. Berube.

Dr. Demeter?

MEMBER DEMETER: Thank you.

So this is a philosophical question. So these workers are obviously all monitored and badged, because that's how you found out about the exposure. They routinely will not -- as their doses are usually low because they're in a more high risk, so if they get a dose, it could be quite, quite high. So they don't have sort of the profile of nuclear medicine technologists.

But I'm trying to think of what would be the additional administrative burden to make them NEWs so that this kind of scenario wouldn't trigger the sort of, you know, work that it's triggered. I don't know what the jump between -- you're already monitoring them and you're already submitting dosimeters to the National Dosimetry Service. The next step would be to make them a NEW. What's the barrier or what's the downside?

MR. MOSES: Colin Moses.

So I'll turn it back to my colleagues who regulate the sector more actively than I.

But maybe I'll just give you an example from another sector that's relevant. So in the portable gauge industry, typically the exposures are well below 1 mSv. But for those technicians that are quite active, so they're doing what you refer to as shots or measurements upwards of 650 to 700 a year, then those doses start approaching 1 mSv, in which case the obligation to inform them of the radiation exposures, record their doses, et cetera, gets triggered.

And so in those cases, licensees in their programs are sort of monitoring and then may designate as, you know, depending on the workload within the year, whereas in this case, the exposures or occupational

exposures are typically very well below the 1 mSv. And so that designation, if anything, would obscure instances where the dose is increasing or is abnormal such as what was observed in this case.

But to speak to the specific sort of implications of a designation as a NEW and the benefits thereof, maybe I'll ask my colleagues in Radiation Protection to speak to that.

MS PURVIS: Caroline Purvis, for the record.

You rightly point out there are certain types of licensed activities where the workers have the potential to exceed 1 mSv. And so those workers are identified as nuclear energy workers.

There are certain obligations in the radiation protection regulations that come with that on the licensee, and Mr. Moses inferred a couple. So there's requirements for training, for explanation of the risks, for informing the workers of their dose results on a periodic basis. So there's more obligations on the licensee.

But on the other side of it, there's probably a better-informed workforce. They have probably a better appreciation for the risks associated with the

activities that they're conducting. So there's pros and cons.

Some hospitals and entities, even if the potential for exposure is above 1 mSv or low, such as in this type of workforce, it just makes sense for them. The potential is there. So I think it depends on each applicant how they will wish to manage their program. And if they can demonstrate that the exposures will not exceed one, then perhaps that's the right choice for them.

MR. BROEDERS: I just want to complement Ms Purvis' answer by saying that I think some of this is historic as well. So the evolution in radiotherapy has been from source-based treatment to accelerator-based treatment. You're quite correct that under normal circumstances, a radiation therapist who is rostered to external beam radiotherapy should not get any appreciable dose. The bunkers are well designed, because they have a life span of many decades. And so they're typically very well designed. So the purposes of monitoring them and having a radiation safety program is for an acute exposure, because machines are very powerful. But it's very unlikely that they would be exposed to the full impact of a primary beam.

There is another reality too that some

centres, the therapist may be mobile and may move from external beam activities to, say, brachytherapy where the risk is somewhat higher. More likely in accidents, there -- accident? -- unexplained behaviour of, I guess, of the afterloader where they have to enter the room and recover the patient. So in that context, there's a higher risk on that; it would be suitable. So probably just it might just be simpler to have -- declare those positions for all therapists to be NEWS.

I'm not so sure in the medical sector, but certainly in the commercial sector and industrial sector there's some union issues as well. I think it's simpler for them to not selectively appoint some positions NEWS and others not, because that has ramifications on their collective agreement and how they're compensated and what they're allowed to perform.

But maybe I'd ask Dr. Petric if he wanted to comment specifically on their approach in B.C.

DR. PETRIC: Hi, yeah, Dr. Petric here.

So we do have some nuclear energy workers in the building. They're nuclear medicine technologists, so PET techs. They're a small group. The RT group in Vancouver in particular is a very large group, so that added training as well as the annual informing of doses

would actually be a fairly significant administrative burden for us to include them as nuclear energy workers as well.

One of the other things that we've come across is because our dosimetry provider is a company that is based in the United States, there are some privacy concerns that have come up to do with nuclear energy workers, with their doses, essentially providing those dosimetry services with social insurance numbers and dates of birth. So we've tried to sort of minimize that by only doing that for our nuclear energy workers, which is the small group.

But having to, you know, include -- we're talking about just for Vancouver it's probably 200 extra workers compared to what we have now, which is probably about 20 -- to have to get all those privacy forms signed, never mind the added risk that one of those radiation therapists is actually going to have a concern about their privacy of information going to a United States company.

The concern is really around the US government using their -- I forget what it's called now -- their information of freedom act or their Patriot Act to actually assess that information, because it is held in the United States. So that's an extra concern.

MEMBER DEMETER: Okay, thank you.

I mean, you get to choose which dosimetry service you use and whether you use the National Dosimetry Service in Canada or a US one, that's a choice you make. I guess --

DR. PETRIC: Actually, sorry to interrupt, unfortunately it's actually been taken away from us. It's actually been provincially legislated. Like there's been a working group, and all the health authorities in I believe it's B.C. actually got together, and they actually decided. And we've been forced to go with a certain group.

MEMBER DEMETER: It's a decision your government's made, then.

DR. PETRIC: Yeah.

MEMBER DEMETER: I guess the concern I have about not declaring a radiation therapist a NEW is if they came into a situation where there's a brachytherapy loader unit that's malfunctioning and they have to try to go fix it. Even though their dose is going to be low, if they know that the dose limit for them is 1 mSv, is their behaviour going to be affected and their ability to manage that kind of situation? So just a philosophical question I had and but I think you've answered it appropriately. Thank you.

THE PRESIDENT: Thank you.

Dr. Lacroix?

MEMBER LACROIX: This is a cumulative whole-body effective dose, right, for the period of three months. Now, what is the margin of -- how do you say? -- of error on this measurement of 1.85 mSv in percentage?

DR. PETRIC: We actually have to ask the dosimetry providers. They're -- it's fairly small, I believe. I think they basically say they can measure fairly reliably down to 10 μ Sv, so 0.01 of a millisievert. Yeah.

And to tell you the truth, I mean, typically the doses coming back are fairly, you know, reliable. The thing that I have to mention though is that every five years or so -- I mean, it's very very intermittent, we do get very strange -- like, just one-off strange reading that we'll get somewhere.

We've had at least one before in Vancouver, but I've heard from other centres across the province, just these spurious unusual readings that make no sense and they're sort of similar to this one, where they're unexplainable. But they tend to be, you know, over our action level or over our limit sometimes.

So I'm not sure. You know, there's part

of me that kind of speculates or thinks that there could be something wrong with that certain badge, even though they claim to do a reread and that there's no spurious issues with the reader or the badge, you know. I don't know, we'd have to ask the vendor more specifically.

MEMBER LACROIX: Staff, are you concerned with this answer?

MS PURVIS: Caroline Purvis, for the record. The CNSC licenses dosimetry service providers and there are commercially three that operate and offer external dosimetry. There is the one that was mentioned earlier, this National Dosimetry Service, which is a Canadian organization through Health Canada. There's two others that are licensed to provide external dosimetry, and they're headquartered in the United States.

I'm not sure which one, off the top of my head, the U.S. company that was used in this particular event, but typically both those entities they're minimum reportable level is 0.01.

So usually they can detect below that reportable level. That's the level at which they will report to the National Dose Registry a recordable dose.

With respect to the uncertainty with that measurement, I would have to check with my specialists and

get back to you. If you would like that information, I'd be happy to provide it.

I would be concerned if I felt that there was a systematic issue with spurious results. I'm not aware of that.

MEMBER LACROIX: Is the dose measured with the same dosimeter for the whole period of three months?

MS PURVIS: I'll let the licensee respond, but typically that's what happens for an external dosimeter that's worn on the torso of the individual.

The monitoring period can vary, depending on the licensed activity, but often it's quarterly. So, yes, it's worn for a three-month period.

DR. PETRIC: Yeah, I can answer that. So, yes, radiation therapists are monitored every three months, and for that period they are wearing the same badge.

So that was one badge. Actually there's a bit of follow-up on this specific case. We have been monitoring that individual, you know, a little bit more intently, and I actually just got a report today of her last quarter and it was below minimal detectable limits. So she seems to have come back to normal. So she's had two badges since that time and they've both come back at essentially zero.

We've also given her a direct reading dosimeter, and that's always come back at zero as well, or just background. We have a background badge, and it just matches it all the time, or a background DRD.

So, yeah, a three-month period.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: No questions.

THE PRESIDENT: I have question one for staff and one for Dr. Petric.

So why is this being reported so late to the Commission if this happened in May?

MR. MOSES: Colin Moses, for the record. So two reasons: one, the Commission -- this wasn't viewed as a significant event, and so in terms of the timing of the actual presentation of the EIR and the dialogue at the meeting, the Commission hasn't had a public meeting in Ottawa since that time. So that's why it's coming to this meeting in particular.

There was also an administrative oubli, so you can see in the EIR, it was signed off and finalized in June. However, we did administratively transmit it to the Commission, although we had dialogued around the timing of the EIR, and so we have looked at the processes to make sure we don't forget that last final step, post-signing and

approval, to make sure it does get timely submitted to the Commission Secretariat as well as distribution to Members.

It was only when we were preparing for this meeting, knowing that the IR was on the agenda, that we had realized that that final step hadn't taken.

THE PRESIDENT: Thank you. Because even though it may not get discussed until later, Commission Members want to know when a limit has been exceeded.

Dr. Petric, question for you. After this incident happened, did you check to see how common a practice it is for your folks to take the dosimeters home?

DR. PETRIC: We always mention to them at all the training, it's part of our regular training to cover dosimeter care, we always mention not to take it home. Unfortunately, it does happen. We instruct them -- we even go as far as to say if you have taken it home by accident, you know, what to do with it, right? So don't leave it in a hot car, ensure it doesn't get exposed to any kind of radiation source, and bring it back to work as soon as possible.

That said, I think the practice is fairly -- most of the badges are kept here. We do have badge boys that we have erected around the building, specifically for people to put their badges on, and we try

and encourage use of that. But occasionally, badges do get placed sort of in people's lockers or on coat racks.

But, in general, I don't think it's a very prevalent practice of taking them home.

THE PRESIDENT: Yeah, but you're using a lot of qualifiers; generally and most likely and so on. I mean, to see the level of effort it's taken to look at something like this, I think there's just greater vigilance required and it's just a reminder that this is not an acceptable practice that your badge is where it shouldn't be ever.

I mean, I come from a nuclear power background, so it's a little different. But I think that that should get ingrained in all your workforces; badge is either on you or on the rack, and on you only when you're at work.

So I think this incident is just a good reminder to reinforce that throughout your workforce. A thought.

Staff, anything to add?

Okay. Dr. Petric, any other comments you would like to make?

DR. PETRIC: No, I'm good. Thank you for your time.

THE PRESIDENT: Thank you. Thanks for being here to answer our questions.

So we'll take a break for lunch and resume the meeting at 1:00.

Thank you again everyone.

--- Upon recessing at 11:56 a.m. /

Suspension à 11 h 56

--- Upon resuming at 1:01 p.m. /

Reprise à 13 h 01

CMD 19-M24/19-M24.A

Oral presentation by CNSC staff

THE PRESIDENT: Good afternoon. We're ready to resume our meeting

The next item on the agenda is the Regulatory Oversight Report for Canadian Nuclear Laboratories Sites for 2018 as outlined in CMDs 19-M24 and 19-M24.A.

The public was invited to comment in writing. The Commission received nine submissions, one Indigenous group will be making an oral presentation later this afternoon.

I'll turn to CNSC Staff for their presentation. Ms Murthy, over to you please.

MS MURTHY: Thank you. Good afternoon, President Velshi, Members of the Commission, my name is Kavita Murthy and I am the Director of the Canadian Nuclear Laboratories Regulatory Program Division at the CNSC.

My staff and I are here today to present to you CMD 19-M24, a Regulatory Oversight Report covering CNSC Staff activities at sites managed by Canadian Nuclear Laboratories, or CNL, in calendar year 2018.

Presenting with me today are Patrick Burton, the project lead for this ROR as well as Brett Legree and Jennifer Sample.

We are supported, as always, by the team of subject matter experts from CNSC and other project officers at the CNSC who are involved in the regulatory oversight of CNL.

In our presentation today we will walk you through the highlights of CNSC's regulatory oversight of CNL's activities. We will also provide you updates on two events, which we provided Event Initial Reports to you in February of 2019. We will close out the presentation by summarizing some key themes that were raised by intervenors commenting on the regulatory oversight report.

We will begin with an overview of regulatory oversight reporting. CNSC Staff use regulatory oversight reports to communicate relevant information to the Commission in a manner that is accessible to interested members of the public and Indigenous groups.

The ROR for Canadian Nuclear Laboratories sites in 2018 is one of five regulatory oversight reports that CNSC Staff have produced, two of which have already been discussed in these proceedings. The CNL Regulatory Oversight Report, CMD 19-M24 and the French version CMD 19-M24-f, were made available for public comment in September 2019.

This is the first time that a regulatory oversight report which is specific to CNL has been presented to the Commission.

As mentioned before, the ROR for CNL sites in 2018 provides a summary of CNSC Staff's regulatory oversight efforts to cover CNL's activities. In the report we rate CNL's performance against each of the CNSC's 14 safety and control areas.

We provide detailed data: on radiation doses to workers and the public; on the releases of radioactive substances to the environment as a result of the licensed activities; and, on CNL's conventional health

and safety performance.

We also provide an update on proposed projects on CNL sites, some of which are undergoing an environmental assessment under the *Canadian Environmental Assessment Act 2012*.

Before proceeding any further, I would like to bring forward to your attention certain errata in our report, which we noted after the report was released for comment. Please note that none of the errors have a material impact on the conclusions drawn in the document. We will ensure that these errors are corrected prior to the publication of this report.

I will now hand over to my colleague Patrick Burton to continue the presentation.

MR. BURTON: President Velshi, Members of the Commission, my name is Patrick Burton and I'm a Senior Project Officer and Nuclear Inspector in Canadian Nuclear Laboratories Regulatory Program Division at the CNSC.

I'll begin by speaking briefly to the scope of this Regulatory Oversight Report.

The map on this slide shows the geographical locations of CNL's licensed activities covered in this regulatory oversight report. Starting from the

west, it includes: Whiteshell Laboratories in Manitoba; the Douglas Point Waste Facility; the Nuclear Power Demonstration Waste Facility; Chalk River Laboratories; and, the Port Hope and Port Granby projects, all in Ontario, and the Gentilly-1 Waste Facility in the Province of Quebec.

All of these sites are owned by Atomic Energy of Canada Limited, however CNL is the licensee responsible for the safe operation of these sites.

CNSC Staff have produced a regulatory oversight report focused on CNL in order to streamline reporting to the Commission on CNL's diverse activities, all of which are carried out under the common framework of CNL's corporate programs.

In mid-2018 the CNSC created the Canadian Nuclear Laboratories Regulatory Program Division, which has the responsibility for managing the regulatory oversight for all of these sites.

Throughout this presentation, we will be making reference to CNSC Staff's risk classification for these sites. The risk of a licensed activity is classified as low, medium or high based on the potential impacts associated with that activity.

The risk classification considers: the

consequences of a failure on the safety of workers and the public, on security, and on the environment; the nature of the hazards associated with a given activity; and, the scope scale and state of operations, including the number of workers on the site.

Where multiple licensed activities occur on a single site, the risk classification for the site reflects all of the activities on that site. Risk classifications are reassessed on an as-needed basis, such as when licensed activities change significantly.

CNSC Staff's baseline regulatory efforts are proportional to the risk classification of each site.

The table on this slide shows CNSC Staff's risk classification for CNL's licensed activities. The licence numbers are shown in the last column of the table, with the expiry date indicated as the last four digits of the licence.

A licence renewal hearing for Whiteshell Laboratories concluded on October 3rd, 2019. The licence shown on the slide for Whiteshell is the current licence, which expires on December 31st, 2019.

In addition to the licences shown here, CNL's holds two licenses that were not included in this regulatory oversight report. One of these, the licence for

the LaPrade heavy water storage facility was omitted because it is covered by CNSC Staff's regulatory oversight report on the use of Nuclear Substances in Canada. The second licence is for the remediation of historic wastes, and it was omitted because CNL did not carry out any work under this licence in 2018.

The table on this slide lists the changes to the licences and licence conditions handbooks for CNL sites in 2018. Cases where CNL requested changes to a licence in 2018, but the Commission's decisions were taken in 2019, are also included in the table.

The most significant changes in 2018 were the renewal of the operating licence for the Chalk River site for a period of 10 years and the amendment of the Port Granby licence to incorporate revised environmental release limits. The Port Hope Project is absent from the table because there were no changes to either the licence or the licence conditions handbook in 2018.

Over the next several slides I'll provide information on CNSC Staff's areas of focus at each CNL site in 2018, beginning with Chalk River Laboratories, CNL's largest and most complex site.

Chalk River is an active nuclear research

and test establishment located about 160 km northwest of Ottawa. The site is undergoing a period of rapid change and revitalization with the decommissioning of aging infrastructure and construction of new facilities.

In 2018 CNSC Staff focused on CNL's decommissioning of legacy facilities and their planning and constructing new facilities. A significant amount of staff effort was expended on assessment of CNL's application for the construction of a near-surface disposal facility on the CRL site.

CNSC Staff are also assessing the plan to host a small modular reactor at the site. Note that CNL is not the applicant for the licence to prepare a site which has been submitted to the CNSC. CNL is playing a supporting role in that proposal.

Neither the near-surface disposal facility nor the construction of any new reactors are approved by the current Chalk River licence, approval from the Commission would be required for each.

The largest change at the CRL site in 2018 was the permanent shutdown of the National Research Universal reactor, or NRU, which occurred on March 31st, 2018.

CNL's Molybdenum-99 production facility

has also been permanently shutdown, this facility depended on NRU for irradiated targets and had not run in over a year prior to NRU's shut-down.

NRU's closure has reduced the risk profile of the Chalk River site as a whole. The likelihood of an accident at the Chalk River site having off-site consequences has been reduced.

Since NRU's shutdown, CNL has removed all fresh fuel from the NRU facility and all used fuel and heavy water from the NRU reactor core. This work was part of CNL's preparation for transferral of the facility to their decommissioning staff, and NRU eventually being placed in a state of storage with surveillance.

Under the current licence, CNL is not permitted to begin active decommissioning work in the NRU facility.

Whiteshell Laboratories is a shutdown nuclear research and test establishment whose current licence expires on December 31 of this year.

In 2018 CNSC Staff spent considerable time reviewing CNL's application for the site licence renewal. As CNL continued its decommissioning work at the Whiteshell site, CNSC Staff's compliance efforts in 2018 focused on those activities.

Most significantly, a considerable amount of staff effort was expended in the ongoing review and assessment of CNL's proposal to perform *in situ* decommissioning of the WR-1 reactor at that site.

The project proposes to decommission the reactor by pouring engineered grout into the subsurface structures as a means of encapsulation. *In situ* decommissioning falls outside the licensing basis for security -- excuse me, for Whiteshell, and is currently undergoing an assessment under both the *Canadian Environmental Assessment Act of 2012* and the *Nuclear Safety and Control Act*.

A Commission decision on the project will be made following public hearings, the dates for which have not been set.

The Port Hope area initiative is a project to clean up legacy contamination in the municipalities of Port Hope and Clarington, Ontario. It is composed of two separate but related projects, the Port Hope project and the Port Granby project.

Both involve the excavation of historic low level waste and the placement of that waste in newly-built long-term waste management facilities, or LTWMFs.

In addition to the LTWMF, each of the sites has its own facility for the management and treatment of leachates and impacted water, that is, water that may have come into contact with radioactive waste.

The Port Hope project is the larger of the two projects, and it is unique in Canada in that it involves the remediation of large volumes of low level radioactive wastes from residential and commercial areas.

In 2018, CNSC Staff carried out inspections on CNL's construction milestones, including inspection of liners installed in the different cells of the LTWMF and on CNL's first receipts of off-site wastes into the LTWMF.

Management of impacted water on the Port Hope site posed challenges for CNL in 2018, and CNSC Staff made this an area of focus for some compliance activities. CNL considerably increased their storage capacity for impacted water in 2018 to allow them to better deal with situations such as extreme precipitation or snow melt.

One of the most publicly visible areas being remediated under the Port Hope project is the Port Hope Harbour and the adjacent Centre Pier property. The photograph on this slide shows the wave attenuator in the harbour entrance, Cameco's Port Hope conversion facility in

the background, and the Centre Pier itself in the foreground.

CNSC Staff maintained oversight of preparations to remediate the harbour and a remediation of wastes from the Centre Pier. These activities involve both CNL and Cameco Corporation, who until recently were in control of the Centre Pier.

CNSC Staff also prepared to carry out compliance activities on CNL's small-scale site remediation work, which involves the removal of wastes from the areas surrounding homes and businesses in Port Hope.

Some initial testing of the methodology was done in 2018, and more extensive work is expected to be carried out as the pace of CNL's remediation work increases.

Through its surveys of residential properties, CNL has identified over 1,000 small-scale properties as requiring some level of remediation.

The Port Granby project is broadly similar to the Port Hope project, but it does not involve the remediation of urban areas and is further advanced in its schedule.

In 2018, CNSC Staff performed inspections on CNL's excavation of legacy wastes as well as CNL's water

management practices.

During the Port Granby project licence hearing in 2011, the Commission accepted interim effluent limits for the Port Granby project's future wastewater treatment plant with the intent that these would be applied while CNL optimized the performance of the plant over one year of operation.

Following that year of operation, in 2017 CNSC Staff provided CNL with a methodology for establishing release limits which is consistent with other jurisdictions within Canada and internationally.

In 2018, CNL applied for a licence amendment to incorporate the new effluent release limits which were ultimately granted by the Commission.

CNL has also faced water management challenges at Port Granby. In response, CNL made adjustments and modifications to the wastewater treatment plant to optimize its throughput and installed significant additional water storage capacity.

CNSC Staff verified the implementation of these measures.

The Douglas Point, Gentilly-1 and nuclear power demonstration reactors are all former prototype power reactors which have been in storage with surveillance for

some years. In 2018, CNSC exercised regulatory oversight on CNL's work to identify and remove hazards from these facilities and to characterize wastes in preparation for full decommissioning.

Similar to the *in situ* decommissioning proposal for the WR-1 reactor, CNL has put forward an application for the decommissioning of the NPD reactor using a very similar approach. Again, a considerable amount of CNSC Staff effort was expended in the ongoing review and assessment of this proposal, which is currently undergoing an assessment under the *Canadian Environmental Assessment Act of 2012* and the *Nuclear Safety and Control Act*.

A Commission decision on the project will be made following public hearings, the dates for which have not yet been set.

Until 2018, the three prototype reactors were included in a single licence. In 2018, CNL requested that the single licence be split into three, with each site having its own licence.

CNSC Staff supported this request, as it provides for more flexible regulation of CNL's diverging plans for these three sites.

The Commission granted CNL's request to

separate the licence in early 2019. This did not introduce any changes to the authorizations or the expiry date of the previous licence.

In 2019, CNL has requested an amendment to the Douglas Point licence to allow the dismantlement of that reactor, and CNSC Staff have begun a technical assessment of CNL's licence amendment application. The licence amendment request will be considered by the Commission in a public hearing in 2020.

This completes the overview of CNSC Staff's activities on the different sites. I'll now pass the presentation to my colleague, Brett Legree.

MR. LEGREE: Good afternoon, President Velshi and Members of the Commission.

My name is Brett Legree, and I am the Nuclear Facility Site Office Supervisor at the CNSC's Chalk River Laboratory site office, which is located on CNL's Chalk River Laboratory site. I am also a nuclear inspector.

I will now describe CNSC Staff's regulatory oversight of CNL sites in 2018 in more detail.

CNSC Staff's regulatory oversight activities include field inspections, desktop reviews and technical assessments of reports and submitted documents.

Where non-compliances or unsafe practices are identified, CNSC Staff have ample tools to ensure that licensees return to compliance.

These include conducting additional inspections, making binding requests on the licensee under Section 12(2) of the General Nuclear Safety and Control Regulations, issuing orders and issuing administrative monetary penalties, among others.

When evaluating compliance, CNSC Staff do not consider whether a given worker is the employee of the licensee, a contractor or a sub-contractor. All are persons subject to the *Nuclear Safety and Control Act*.

CNL's sites are regulated under the CNSC's Nuclear Fuel Cycle Program, and under this program, as described earlier, the appropriate level of regulatory oversight is determined via an assessment of the risk posed by a given licensed activity.

This correlation between risk classification shown in the second column and CNSC Staff effort is shown in this table, showing the number of inspections performed and the number of CNSC Staff hours spent on compliance in 2018.

The CNSC has an external complaints process which allows anyone to confidentially raise issues

about licensed activities. There were two focused inspections carried out by CNSC Staff in response to external complaints in 2018.

One inspection was at the Port Hope area initiative in May 2018, and a second one was carried out at the Chalk River site in June of 2018.

Neither focused inspection found evidence that CNL discourages workers from raising safety significant issues, but it was found that there could be some reticence in raising other types of issues.

As an outcome of these inspections, CNSC Staff requested that CNL carry out a corporate-wide safety culture self-assessment. CNL has transmitted information regarding their self-assessment methodology to CNSC Staff and must communicate the results of the self-assessment to CNSC Staff by March 31st, 2020.

I will now speak to how CNSC Staff evaluate CNL's performance against the CNSC's safety and control area framework.

When evaluating licensee performance, CNSC Staff use a set of 14 safety and control areas, or SCAs. The ratings for each SCA are generated for each licence every year on the basis of CNSC Staff's regulatory oversight activities. The 14 SCAs are listed in the box on

the right of the slide.

CNSC Staff rate performance based on multiple inputs, including key performance indicators such as dose to workers and releases to the environment, results of CNSC compliance activities such as inspections and technical assessments and the effectiveness of licensee corrective actions in response to non-compliances.

Ratings represent a holistic summary of licensee performance in each SCA.

Each year, CNSC Staff establish a performance rating for each CNL licence against each SCA as shown on the slide for the 2018 year. Ratings for the previous four years are also included in the regulatory oversight report itself.

For 2018, CNSC Staff have rated CNL's performance across all SCAs and sites as satisfactory, with the exception of the security SCA at Whiteshell Laboratories, which was rated as below expectations. This matter was discussed at the October Commission hearing on Whiteshell relicensing.

CNSC Staff are closely monitoring CNL's performance and security at Whiteshell.

Even though ratings are provided for all SCAs, this regulatory oversight report focuses on three

SCAs, namely, radiation protection, conventional health and safety and environmental protection, as these are key indicators of the effectiveness of a licensee's management of the risks at its sites.

Before covering the SCAs of radiation protection, environmental protection and conventional health and safety in more detail, I will briefly speak to the concepts of action levels and regulatory limits.

Regulatory limits and actions levels are relevant to both the radiation protection and environmental protection SCAs. Both are tools for regulating doses to persons and releases to the environment.

As can be seen on the slide, action levels shown in blue are the lower of the two. Action levels are set below regulatory limits, which are shown in red. The range of normal operation is indicated by the green dots.

Action levels are set above the upper value of normal operation to serve as an early warning indicator of a potential loss of control of the radiation protection or environmental protection program. Action levels are set by the licensee on the basis of actual performance data and are reviewed by CNSC Staff.

Exceeding an action level is reportable to the CNSC, but it is not a non-compliance with the licence

and, in fact, it is expected that action level exceedances will occur from time to time. Licensees must investigate action levels exceedances to make sure that no loss of control is occurring.

Regulatory limits are found in regulation or in the licensing basis. They are higher than action levels and represent an upper bound that, if exceeded, would result in a non-compliance with the licence or with the regulations. As with any non-compliance, CNSC Staff take enforcement action if this occurs.

I will now speak to CNL's radiation protection performance.

CNL has a corporate radiation protection program which is implemented in site level procedures, plans and programs. This program has been reviewed and accepted by CNSC Staff.

The doses received by workers at CNL sites and the estimated dose to the public near CNL sites were both well below CNSC regulatory limits as supported by the charts on the following slides.

There was a single radiological action level exceedance at CNL's Port Granby site where a nuclear energy worker received an effective dose of 1.16 mSv over a four-week period. This is slightly above CNL's action

level of 1 mSv, but significantly lower than the 50 mSv annual regulatory limit.

CNL investigated the cause of the exceedance and determined that the 1 mSv action level was too low for the activities taking place at the Port Granby project.

CNL concluded that the action level exceedance did not represent a loss of control of CNL's radiation protection program. Subsequently, CNL revised its radiation dose action level to be more reflective of the expected doses resulting from the Phase 2 remediation activities taking place.

CNSC Staff reviewed the proposed changes to the action levels and found them to be acceptable.

CNSC Staff are satisfied with CNL's reporting and investigation of the action level exceedance. CNSC Staff conclude that CNL's radiation protection programs were effective at controlling radiological hazards in 2018.

This slide shows average and maximum effective doses for nuclear energy workers, or NEWs, at CNL sites in 2018 against the annual regulatory limit of 50 mSv.

It can be seen that average effective dose

to NEWS across all sites are extremely low; in fact, well below the dose limit for the public. Also, the maximum effective doses received by NEWS across all sites is well below the annual regulatory dose limit.

The dose fluctuations from site to site are due to the varying scope and duration of radiological work conducted along with the dose rates associated with the work activity.

Estimated doses to the public are calculated based on data for emissions of radio nuclides from each site. The annual dose limit for a member of the public is 1 mSv, and data for some of CNL's sites from 2014 to 2018 are shown on the slide.

It can be seen that for these sites, estimated doses to the public have remained at a small fraction of the regulatory limit.

Douglas Point and Gentilly-1 are each on larger nuclear sites, the Bruce and Gentilly-2 nuclear generating stations, respectively. The estimated doses to the public are included in data for those sites as a whole and are not captured separately.

The public dose data for these sites was reported in the ROR for nuclear power plants yesterday. Releases of radio nuclides from NPD are extremely low and,

therefore, the dose to the public from that site remains small.

I will now speak to CNL's environmental protection program.

Environmental protection programs at all CNL sites incorporate a set of action levels. In 2018, there were six environmental action level exceedances, with three at the Chalk River Laboratory site and three at the Port Hope area initiative sites.

The exceedances at CRL were all related to airborne releases from the NRU reactor. Two occurred while the reactor was still running and were due to the same experiment involving defected fuel. The third occurred after NRU had permanently shut down and was due to CNL replacing ion exchange columns at a higher than usual frequency while decontaminating heavy water.

Two of the three action level exceedances at the Port Hope area initiative occurred at the Port Hope project wastewater treatment plant. Both exceedances occurred in July where water levels in the collection pond were low, causing the concentration of arsenic to increase.

As a corrective measure, CNL has since made changes to its operating procedures to account for when water levels in the collection pond are low and the

concentration of contaminants increases.

The third reported action level exceedance was determined to have been caused by a laboratory error. CNL has implemented administrative corrective measures to help prevent future lab errors.

For all of these events, CNSC Staff's analysis indicates that they did not represent a loss of control of CNL's environmental protection program and did not pose a threat to the environment or the health of persons.

As a follow-up to CNSC Staff commitment to open government, the CNSC is making radio nuclide data -- release data more readily accessible to the public. The data for radioactive emissions from CNL sites for the reporting period of 2014 to 2018 is included in Appendix H of the Staff CMD 19-M24.

This data is intended to complement the publicly-available data on non-radiological emissions available through the National Pollutant Release Inventory Database. The 2018 data shows that while radiological emissions exist at all CNL sites, they are at levels which are safe for workers, the environment and the public.

The graphs on this slide are examples of the data which is included in Appendix H of the regulatory

oversight report. Please note that these graphs are on a logarithmic scale.

The graphs show releases of argon-41 and iodine-131 from the Chalk River laboratory sites.

For iodine-131, there is a notable drop in emissions from 2016 to 2017. This is due to CNL's cessation of production of Molybdenum-99 in October 2016.

For argon-41, there is a similar drop, but from 2017 to 2018. This is due to the shutdown of NRU in March 2018.

It can be seen that at all times releases were well under the derived release limits.

In addition to analyzing licensee environmental data, CNSC Staff also carry out an independent program of sampling and analysis in publicly accessible areas around nuclear facilities as part of the CNSC's independent environmental monitoring program, or IEMP.

CNSC Staff collect the samples and send them to the CNSC's state-of-the-art laboratory for testing and analysis. The results are posted on the CNSC's public web site.

Under the IEMP, CNSC Staff carried out sampling near Gentilly-1 and NPD in 2018, among other

sites. The results from those activities confirm that the environment near those sites is safe.

The photographs on the slide shows CNSC Staff sampling water from the St. Lawrence River with the Gentilly-1 and Gentilly-2 reactor buildings visible in the background. The map on the slide shows the types of samples and the locations where these samples were collected.

The IEMP process consists of developing site-specific sampling plans for each nuclear facility, taking into account the types of emissions from the site and understanding the characteristics of the receiving environment and the lifestyles of the inhabitants.

When developing an IEMP sampling plan, CNSC Staff work closely with indigenous knowledge holders who can identify and explain the traditional uses of plants and animals. In the case of NPD, CNSC Staff worked with the Algonquins of Ontario to ensure that relevant samples were taken from the area for analysis.

The photo on the slide shows a CNSC Staff member harvesting choke cherries from the vicinity of NPD.

The IEMP results are all published on the CNSC's web site. They indicate that there is no adverse impact to the environment from CNL's licensed activities.

I will now speak to conventional health and safety at CNL sites.

At most CNL sites, conventional industrial activities are the greatest risk to persons due to the site revitalization and decommissioning activities at CRL, decommissioning work at Whiteshell Laboratories and extensive earth-moving work at the Port Hope area initiative.

CNL reports data on recordable lost time injuries, or RLTIs, for all of their sites. With the exception of the Chalk River Laboratories and Whiteshell sites, the other sites have not recorded a lost time injury since 2014.

Data going back five years for Chalk River and Whiteshell is shown on the slide. The frequency and severity of our RLTIs at CNL sites in 2018 is in line with reporting from similar industries.

I will now briefly cover IAEA safeguards at CNL sites.

Under the Canada IAEA Safeguards Agreements, the IAEA has the right and responsibility to verify that Canada's nuclear activities are exclusively peaceful in nature.

Much of this work involves the IAEA

verifying that the inventories of nuclear material at Canadian sites are correct and complete. As part of that work, the IAEA carried out nearly sixty activities at sites licensed to CNL in 2018. For most of these activities the IAEA was accompanied by CNSC staff which provides a valuable opportunity to evaluate licensee compliance with their safeguards requirements.

Neither the IAEA nor CSNC staff identified any significant issues as a result of these activities. CNSC staff continue to work with CNL on previous issues related to the timeliness of CNL's safeguards reporting to the CNSC.

I will now pass the presentation to my colleague Jennifer Sample.

MS SAMPLE: Good afternoon, President Velshi and Members of the Commission. My name is Jennifer Sample, and I am a Senior Project Officer in the Canadian Nuclear Laboratories Regulatory Program Division.

The following section includes information on reportable events at CNL sites in 2018, as well as other matters of regulatory interest.

CNL is required to report to the CNSC various events involving its licensed activities. Examples of events which are reportable include, exposures of

persons to radiation in excess of dose limits; injuries related to the licensed activity; and, unintended releases to the environment.

When CNSC staff receive an event report from CNL that report is analysed and relevant expertise is employed in the review process. During the review, CNL's next steps are analysed and CNSC staff may request further documentation, updates on corrective actions, or even perform a targeted inspection.

In cases where there is doubt regarding the reportability of an event, CNSC staff encourage CNL to report. In this sense, having a higher number of reportable events can be seen as an indicator of a positive reporting culture at the licensee. Events and situations that have a potential for the involvement of Commission members with respect to its decision making responsibilities or are deemed to be of interest to the Commission are identified and reported by the CNSC staff to the Commission members by the way of an event initial report. There were no event initial reports for CNL sites in 2018.

The CNSC recognizes the importance of providing the public and indigenous groups with objective, scientific, technical and regulatory information. To

support this objective staff routinely engage with the public and indigenous groups by participation in community events and meetings. Recent engagement has focussed on proactively going to where interested parties are to increase accessibility to the CNSC and to promote dialogue.

Events in 2018 included participation in the Port Hope Fall Fair, and in 2019 expanded to include participation in the Petawawa Showcase, the Whiteshell Open House, the Renfrew Fair, a Sagkeeng First Nation Community Meeting and the Manitoba Metis Federation's Annual General Assembly, and the hosting of multiple bilingual webinars. In addition, CNSC staff ensured that all interested indigenous groups were informed of this report, the Commission Meeting and the participant funding opportunities.

CNSC's Participant Funding Program which was established in 2011 supports individual not-for-profit organization and indigenous group participation in the CNSC's environmental assessment and licensing processes. Additionally, the program helps interested parties contribute value added information to the Commission which is subsequently taken into consideration during the decision making process.

For the 2018 CNSC Regulatory Oversight

Report the CNSC awarded participant funding to six applicants.

CNSC staff also review CNL's engagement efforts to ensure compliance with requirements in applicable regulatory documents and to ensure adequate information about proposed or licensed nuclear facilities and activities is disseminated.

Over the past two years CNL has proposed several major projects across multiple sites. These have included the proposed construction of a Near-Surface Disposal Facility for the disposal of low level radioactive waste at the Chalk River site, the proposed *in-situ* decommissioning of the NPD Reactor and the WR1 Reactor, the commencement of dismantlement work at Douglas Point, and the hosting of a small modular reactor at a CNL site, with the most advanced project proposal being for the Chalk River site.

CNSC staff are performing thorough technical assessments of all of CNL's major project proposals and are ensuring conformity with environmental assessment and licensing processes. For each proposal approval from the Commission is needed for both the environmental assessment and licensing aspect.

The next section of this presentation

provides an update on two event initial reports or EIRs. During the February 20th, 2019 Commission meeting, CNSC staff presented two EIRs related to CNL sites. These included CMD 19-M9 regarding a worker that was injured at CNL Port Granby Project and CMD 19-M10 regarding a power outage at Chalk River Laboratories. For both EIRs CNSC staff committed to providing an update to the Commission by December of 2019.

CNSC staff intend the following content to close that action. Both of these events will also be included in the 2019 ROR for CNL sites.

The event at the Port Granby Project occurred on January 9th, 2019 when a worker inadvertently activated the unloading mechanism of a roll-off bin truck by a remote control in their pocket. The worker was consequently pinned by the roll-off bin. CNSC staff reviewed CNL's corrective actions and found them to be acceptable. They included, bulletins regarding safety around remotely operated mechanisms at all sites; and, training for persons operating such mechanisms.

CNSC staff subsequently verified implementation of these corrective actions during an inspection in the field and found them to be acceptable.

The site-wide power outage at Chalk River

Laboratories on February 3rd, 2019 was caused by a fire in aging cable insulation. The situation was compounded by switch gear which did not function as intended, and this led to the main circuit breaker tripping. This left the bulk of the CRL site without power, with the exception of certain buildings supplied by backup diesel generators.

One of CNL's sets of diesel generators also had a switch gear issue which left some additional buildings without power.

CNSC staff have monitored CNL's responses to this event and met with CNL in August to review their root cause analysis and the resulting corrective actions.

CNL's corrective actions include a prioritized plan to test electrical infrastructure and a site-wide re-evaluation of circuit breaker trip points.

In the interim, CNL has taken conservative measures to ensure that the situation does not reoccur.

CNSC staff are satisfied with both corrective actions and will continue to monitor CNL's progress on implementing corrective actions going forward.

I will now pass the presentation back to my colleague Patrick Burton.

MR. BURTON: We'll finish our intervention on interventions. CNSC staff received nine presentations

with this CMD. Detailed intervention tables have been prepared in response to the recommendations and comments which were specifically addressed to CNSC staff. These tables are attached at the end of this presentation.

Key themes from the interventions included, Public Information And Disclosure For CNL Sites. In general, intervenors are seeking more information about CNL's activities.

Indigenous Engagement And Consultation. Several interventions were from indigenous groups. Some of these groups feel that they have been inadequately consulted thus far and all are requesting increased consultation and engagement going forward from both CNL and the CNSC.

Lastly, Waste Generation Management And Transport. All of CNL's sites involve the generation, management and transport of radioactive wastes, and intervenors are seeking further information regarding CNL's plans and activities.

I'll now speak to CNSC staff's responses to each, beginning with Public Information. As a condition of its licenses, CNL is required to maintain a Public Information and Disclosure Program. The primary goal of this program is to ensure that information related to the

health, safety and security of persons and the environment and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The program has developed taking into account the level of public interest in the activities.

CNSC staff verify CNL's compliance with that program through the evaluation of their disclosures against their obligations. CNL is required to disclose extensive information to the public, however, several interventions have requested that CNL disclose information which is beyond the requirements of their public information program. In such cases, CNSC staff can encourage CNL to disclose further information as a best practice, but CNL is under no obligation to do so.

CNSC staff frequently receive requests for licensee documentation and where that documentation is cited in a Commission member document prepared by CNSC staff, CNSC staff will provide the document.

In other cases -- in all other cases, CNSC staff may have a limited ability to disclose sensitive or third-party information. Requests for licensee documents are therefore best directed to the licensee, in this case CNL.

CNL has contact information on their

website so that interested parties can make such requests.

Several interventions requested that the CNSC share more information with indigenous groups and that the CNSC provide additional opportunities for indigenous groups to participate in CNSC processes. The CNSC, as an agent of the Crown, has a duty to consult with indigenous groups. CNSC staff are committed to building long-term, positive relationships with indigenous communities. We understand that such relationships must be built on mutual trust which can take time to develop.

CNSC staff have already begun working closely with indigenous groups when planning IEMP activities in areas of interest to them. And CNSC staff are also evaluating other areas where indigenous groups could be integrated into CNSC processes.

In 2018 CNSC staff signed Engagement Terms of Reference with the Saugeen Ojibway Nation and the Historic Saugeen Métis and are working on Terms of Engagement with other groups such as the Algonquins of Ontario and the Métis Nation of Ontario.

CNSC staff have carefully noted the content of the interventions received from indigenous groups and will follow up with those groups separately in order to discuss their concerns.

Intervenors also expressed concerns about waste management and the transport of radioactive wastes by CNL. As a condition of its licenses, CNL is required to have programs in place in the safety and control areas of waste management and packaging and transportation at each of its sites.

CNSC staff verify the sufficiency of those programs through desktop assessment and CNL's compliance with them through inspections. Information on radioactive waste in Canada can be found in the *Canadian National Report for the Joint Convention on the Safety of Spent Fuel Management* and on the *Safety of Radioactive Waste Management*.

For 2018 the SCA's of waste management and packaging and transport remain satisfactory. CNL's programs for decommissioning and waste management are appropriate for the activities it carries out.

CNL's site revitalization initiatives for the CRL site and its activities related to decommissioning and remediation at other sites will result in a generation and transport of significant amounts of waste.

CNSC staff have determined that waste management and transport will be areas of regulatory focus for the next several years. CNSC staff will report on

these activities to the Commission in future Regulatory Oversight Reports.

In conclusion, CNSC staff performed extensive regulatory oversight of CNL in 2018 and conclude that in 2018 CNL carried out its licensed activities safely and in compliance with relevant requirements. Radiation doses to workers and members of the public that resulted from CNL's licensed activities remain low. Environmental releases remain below regulatory limits, and CNL's performance in conventional health and safety remain satisfactory.

CNSC staff will continue to verify CNL's compliance with the requirements on them and we will present to the Commission on CNL's performance in a Regulatory Oversight Report covering the 2019 calendar year.

With that, we are happy to receive questions from the Commission.

Thank you.

THE PRESIDENT: Thank you very much for that. I'll ask CNL if they wish to make any comments before proceeding with the oral presentations and written submissions filed by intervenors. Mr. Boyle, any comments or submission you'd like to make?

MR. BOYLE: So thank you, President Velshi. I would like to make a few comments.

So, thank you, President Velshi and Members of the Commission.

Good afternoon, ladies and gentlemen.

For the record, my name is Phil Boyle, I'm Vice-President of Operations and the Chief Nuclear Officer at Canadian Nuclear Laboratories, also known as CNL.

With me here today and seated to my right is Shaun Cotnam, he's CNL's Chief Regulatory Officer. And to my left, is Scott Parnell, he's the General Manager of CNL's historic waste program.

We also have some expertise standing by online in the event that they can be helpful during the questioning.

Today we are here to review our performance in the 2018 calendar year and to respond to any questions you may have about the work being conducted at the sites we operate across Canada on behalf of Atomic Energy of Canada Limited. This includes licenses at the Chalk River Laboratories, Whiteshell, those associated with the Port Hope Area Initiative, and the licenses for the prototype reactor facilities, NPD, Douglas Point and Gentilly-1.

CNL stood before you as recently as a month ago to discuss the renewal of our decommissioning license for the Whiteshell Laboratory site, so today our opening remarks will not discuss the 2018 performance at Whiteshell. We'd like to thank you again for considering that license application.

While I have appeared once briefly before the Commission, I think it would be useful to quickly reintroduce myself. I joined CNL in July of 2018 in my current role. My career has spanned more than 40 years, beginning in the 1970s when I worked as an engineer in United States Naval Nuclear Propulsion Program. Since then I have held progressive roles in nuclear management and operations in both public and private sector organizations leading to the position that I hold today.

Before we take your questions, I'd like to make a few short comments about the accomplishments of the CNL workforce in the 2018 calendar year. Afterwards, the team and I would be happy to respond to any questions.

First, and most importantly, I want to assure the Commission that CNL operates with an unwavering commitment to safe operations and under strong oversight by the CNSC and other regulators.

I want to be very clear safety is CNL's

top priority. We have operated safely during the 2108 calendar year and made improvements that will continue to enhance safety at the sites CNL operates across Canada, and we continue to meet all our regulatory obligations.

In discussing CNL's performance in 2018 I think it's prudent to acknowledge the permanent shutdown of one of our major science and technology facilities, as you have heard from the staff presentation, the NRU Reactor which ceased operation on March 31st, 2018. While NRU has served as a cornerstone of the Canadian nuclear industry for over 60 years and improved the lives of millions of people around the world, its closure has reduced the risk profile of the Chalk River Laboratories campus.

The NRU Reactor has now been defueled. All heavy water has been drained from the reactor vessel and systems, and CNL has been progressively and permanently draining and de-energising systems that are no longer needed so that the facility can be placed into a state of storage with surveillance.

In conjunction with this work, CNL has concluded a number of activities related to medical isotope production and processing. CNL's Molybdenum-99 production facility has ceased production and activities related to the production of Cobalt-60 including processing,

transportation and handling have also been concluded.

This progress extends to other sites that we operate, for example CNL is approaching completion of the Port Granby Project. We have excavated 1.2 million metric tonnes of historic low level radioactive waste from the legacy site and placed it in the new Long-term Waste Storage Management Facility, with the small volume of remaining waste on track to be excavated by the end of this month. This is clearly a major accomplishment.

Capping of the mound is underway with completion anticipated by the end of November 2020.

In Port Hope the remediation of all three temporary storage sites in the Legacy Welcome Waste Management Facility has been completed and the cleanup of residential properties is well underway. Approximately one million metric tonnes of historic low level radioactive waste has been placed in the Long-term Waste Management Facility for safe storage.

I'm pleased to tell the Commission that CNL reached a milestone for the project in the community last week when dredging of contaminated sediment in the Port Hope Harbour began, following more than a decade of planning and a year of preparatory activities for this complex work.

Finally, under the joint regulatory oversight of the CNSC and United States Nuclear Regulatory Commission, CNL has been safely returning materials which contain highly enriched uranium, HEU, to United States. This HEU originates from materials imported to Canada for research and medical isotope production at the Chalk River Laboratories and includes spent HEU fuel rods from NRX and NRU reactors.

To date, CNL has completed repatriation of the HEU in spent fuel form. This activity has benefitted from CNL's decades long experience in safe and secure regulated transportation of these materials.

While these changes have reduced the risk profile of our site, it's important to recognize the complexity of the work that is still being carried out by CNL. As we transition to a future without NRU, CNL is executing an integrated plan to transform the Chalk River Campus through the construction of new world class facilities, revitalization of the central site infrastructure, completion of decommissioning and environmental remediation activities and the establishment of long-term waste management solutions.

This work will ensure that CNL can continue to serve as a leader in the development of nuclear

science and technology products and services on behalf of Canadians.

These activities represent a number of challenges that are unique to our site which is an intricate mix of buildings and infrastructure from different eras that date back as far as the 1940s.

These challenges include the maintenance of legacy system to a safe and reliable level until they are removed and replaced; the decommissioning of old and outdated facilities in coordination with site revitalization and the construction of new facilities, often on the same footprint; the assurance of proper health, safety and radiological controls across diverse work activities and the implementation of ongoing infrastructure improvements to existing facilities and buildings.

Overall, CNL managed these challenges effectively during the 2018 calendar year and we continue to realize improvements in the way we safely deliver this work.

With the safe and permanent reduction of nuclear legacy liabilities, the Chalk River site will be strategically consolidated and modernized through an ongoing federal investment in new facilities and

infrastructure. Through this transformation the Chalk River Laboratories will continue to serve as Canada's National Nuclear Laboratory, delivering nuclear products and services to meet government, commercial, and public priorities.

As part of this revitalization CNL is also growing its nuclear science and technology capabilities and services, combining federal and commercial priorities into research and development programs in sustainable energy, public health, nuclear security and environmental stewardship. This work includes ambitious plans to demonstrate the commercial viability of a small modular reactor, to pursue commercial opportunities related to targeted alpha therapy, a promising new form of cancer treatment, to decarbonize the transportation sector through the production of clean hydrogen energy and to continue to support the life extension and long-term reliability of the existing fleet of CANDU Reactors.

Underpinning all of our activities is a commitment to being open, honest and transparent with our local communities and neighbours, environmental organizations and other interested stakeholders. The men and woman who work at CNL recognize the unique nature of the work that we carry out on behalf of Canadians and we do

our best to ensure that the questions and concerns of these various communities, groups and organizations are properly addressed through our public information program and ongoing engagement activities.

In recent years, CNL has taken major steps to develop meaningful relationships with our local Indigenous communities and we are actively working to establish long-term agreements with them. These interactions are ongoing and allow CNL to ensure its projects and activities respect the rights and interests of our Indigenous neighbours.

With that, I would like to thank you for your time today, President Velshi and Members of the Commission. That concludes my prepared remarks. I would be happy to answer any questions you may have.

THE PRESIDENT: Thank you, Mr. Boyle.

Before we get into the interventions, just a comment that I would like to make.

Several intervenors have raised questions, comments or concerns about proposed CNL projects currently undergoing environmental assessments, including the Near Surface Disposal Facility, Nuclear Power Demonstration Closure Project and the Whiteshell WR-1 Reactor In Situ Decommissioning Project.

The Commission would like to note that these projects are outside the scope of the current ROR, which considers existing CNL facilities and CNL's licensed activities in 2018. These proposed projects will be considered by the Commission during separate Commission hearings, which will include public participation, following the conclusion of the environmental assessments that are currently underway. So they will not be considered in today's meeting.

I would like to start off with our first oral presentation from the Kebaowek First Nation, as outlined in CMDs 19-M24.10A and 19-M24.10B.

Ms Van Schie, I understand you're replacing Chief Haymond today. The floor is yours.

CMD 19-M24.10A/19-M24.10B

Oral presentation by the Kebaowek First Nation

MS VAN SCHIE: Yes, thank you, Madam Chair and fellow Commissioners.

My name is Rosanne Van Schie, I'm a Technical Advisor with Kebaowek First Nation.

I'm accompanied on my right by my daughter, Johanna Van Schie-Copol. She will be changing

the slides as we go through the presentation.

I will just begin by saying Toni Lafrance, the daughter of the late Wolf Lake First Nation Chief Harry St-Denis and Claudia Lafrance's daughter, passed in the community and so Chief Haymond sends his regrets that he can't attend and make this presentation today.

THE PRESIDENT: Our condolences.

MS VAN SCHIE: So I'll just have a slide change.

So Kebaowek First Nation is one of 11 recognized communities making up the Algonquin Nation in Canada. They're based on a Reserve parcel on Lake Kipawa in Southeastern Quebec.

Kebaowek is made up of 999 members. They assert Aboriginal rights over their traditional territory which is located in present-day Ontario and Quebec. Four hundred and twenty-eight members live off reserve in Ontario and they continue to use this territory for traditional harvesting purposes -- fishing, hunting, gathering -- and spiritual and ceremonial purposes.

So the main Reserve is located 15 kilometres from the Ontario-Quebec border. However, there is another Band Office in Mattawa, Ontario, which is very proximal to the Chalk River Nuclear site.

The Algonquin Nation

The traditional territory of the Algonquin Nation includes the entire Ottawa River watershed straddling both provincial boundaries, Quebec and Ontario. Algonquins have never relinquished rights or title to their territory or to their customary name, "Anishnabe".

The Algonquins are a nation of waterways, built around the waterways, mainly organized around the Ottawa River Basin. This is the heartland and their bloodline. They settled the entire length of the Kichi Sipi (which literally translates as "big river") from its headwaters in north central Quebec to the sacred sites at Bird Rock, across from Chalk River Nuclear Facility, and Akikodjiwan, Chaudière Falls in Ottawa and all the way out to its outlet in Montreal.

So the Algonquin Anishnabe definitely have a sense of place on their territory. This was defined by anthropologist Frank Speck in the early 1900s. You can see the red polygons defining their traditional family land management units on the territories and these served as boundaries for families, band and the tribal territories.

The only agreements that the Algonquin Nation has entered into have been the historic peace and friendship Treaties at Oswegatchie and Kahnawake in the

1760s with Britain. The traditional territory and traditional use of the territory was protected from disturbance and settlement by the Royal Proclamation of 1763, as issued by King George III. So the Algonquin Chiefs at the time were a signatory to the Royal Proclamation.

Regardless, there has been quite a bit of displacement historically on the territory, where Algonquin property rights and interests on the territory were flagrantly ignored, as documented by Morrison in the History of the Ottawa River Basin. Conservation practices of Algonquin peoples that ensured that their environmental resources would be sustainable over the long term were also ignored and this is something we're regrouping here on today in terms of consultation because the communities were never consulted on the establishment of Chalk River Nuclear site historically and so this is kind of an unresolved issue in the watershed.

So Kebaowek First Nation, along with the other Algonquin communities, exercise historical and contemporary land use and occupancy on their territory. They have cultural knowledge of their lands and supported by customary law that support sustainability of their resources and their future needs in terms of those

resources, and definitely all the communities want to protect their Section 35 interests for future generations to exercise those rights on their title territory.

This is supported in Canadian law through the Constitution, the Canadian *Constitution Act* and Section 35 which recognizes and affirms the existing Aboriginal and treaty rights in Canada. That has been further supported by different Supreme Court rulings. Kebaowek asserts their title within the Canadian provinces, as I mentioned, of Ontario and Quebec.

In January 2013, Kebaowek presented a joint Statement of asserted Aboriginal Rights and Title to the Government of Canada. This was for the purpose of engaging in formal consultations and impact assessments on the territory. So this current map goes into detail of what that statement of asserted rights looks like on the territory between the three communities and involves historic and contemporary rights. This information is always evolving as per members' use.

The idea of a duty of care over a duty of management is something Kebaowek would like to raise today. Algonquin relationships between families on the territory and the natural world are deep and meaningful and it's something they really care about. The relationships with

the Crown needs to evolve to a place where the Crown can facilitate and accept this idea of duty of care and embrace the idea of customary law and their generational responsibility on the territory.

And this raises this obligation of how nation-to-nation relations can roll out in this context. It's kind of a need to integrate very different world views. For instance, in a formal setting like this it's very difficult to engage community members and leadership to participate because it's just very formal and it would be nice to see more interaction on the territory itself between the Commission and leadership.

This raises too this idea of what is the government's capacity to really consult with First Nation peoples and this can extend to the hearing process. It's very difficult to just have a 10-minute interaction and have limitations in the hearing process itself. So I just want to put the word out, like how do we move forward on expanding consultation in a nation-to-nation context that isn't quite unilaterally derived by the Commission.

In Canada, the duty to consult and accommodate with Aboriginal peoples arises when the Crown contemplates actions or decisions that might affect those rights. I think you are quite well aware of the fiduciary

duty and we know that duty wasn't honoured at the Chalk River site historically, but we do understand that the current government wants to change this history and develop more meaningful nation-to-nation relationships.

I've heard in the earlier presentations the use of the word "group". The Algonquin peoples don't consider themselves a group, they consider themselves a nation and the individual communities consider themselves nations as well, with rights both inherent and protected under the Canadian Constitution and Section 35.

That brings us to -- and I don't know if I'm running out of time here, but I'll try to just breeze through this content here.

This brings us to the topic of environmental legislative reform and how the duty to consult is reflected within it. I know the *Canadian Nuclear Safety Act* wasn't part of the recent modernization process that involved the modernization of the former *Canadian Environmental Assessment Act of 2012* and the *National Energy Board Act*, but we're seeking how to find a middle ground between these different pieces of legislation that are now in place, that are advancing more early engagement with Indigenous peoples and more aspects to do with traditional ecological knowledge-sharing, oral

presentations in the hearing process, et cetera. So we are kind of looking for a mechanism to bridge these new pieces of legislation with your Act that's yet to be modernized. I think you have a sunset clause in your current Act and you're moving towards that, I'm not sure.

But anyway, we're especially concerned with environmental reviews and groundwater and aquatic issues related to historic and current use of the Chalk River Nuclear site on the Ottawa River.

We are seeking a consultation, conflict and collaboration analysis of what's going on and what's been going on in terms of environmental reviews to date that could potentially lead to a consultation framework agreement with our community and other members of the Algonquin Nation. The objective is to meaningfully connect Algonquin knowledge and stewardship to the Chalk River Laboratories site and long-term management of the Ottawa River and its fisheries.

There are some historic and current issues that could be part of that analysis in detail.

We are questioning the recent licensing status and consultation that occurred under that licensing status. There's a difference between the duty of notice and the duty to consult. Certainly, Kebaowek was notified

on the relicensing, but they weren't consulted and how do we bridge these gaps. And that went for the nation as well, they didn't comment on the relicensing, but the Métis Nation of Ontario did, along with the Algonquins of Ontario. Kebaowek First Nation does not endorse, accept or acknowledge any claims to any Aboriginal or Treaty Rights made by the Algonquins of Ontario. They would classify that entity as a group without Section 35 rights.

I do have a note on that topic from a legal counsel that I will just read:

"Algonquins of Ontario in its current form is not representative of a legal or historical Aboriginal people as recognized by Section 35 of the *Constitution Act of 1982*.

Pikwakanagan and Ardoch are the only Aboriginal communities with Section 35 rights. Though we take no position as to whether the representatives of Snimikocha(ph) Ardoch within the AOO represent the Algonquin Ardochs. The Métis of Ontario include collectives that are not representative of any legal or

historical Aboriginal people. For example, there is no historical Métis community in Mattawa. The Indigenous people of Mattawa were Algonquin and are ancestors of Kebaowek First Nation." (As read)

So I mean these are things we could further discuss in a conflict collaboration analysis of the overall situation, but if Kebaowek had the opportunity to fully comment on the relicensing of the CNL site, they would not have agreed with the commercialization proposals of nuclear waste disposal as part of the licence.

And, Madam Chair, I did hear you that that's not going to be part of the discussion today, so I'll just kind of leave it at that.

We did have a few questions to the Commission regarding the licence operator. I don't know that there's time to discuss that today, but these are outstanding questions that we're interested in working with the Commission on resolving.

Is there time to raise these or...?

Okay.

So the first question to the Commission would be:

As Kebaowek does not support -- as well as other Algonquin communities -- nuclear waste management as a business on the territory, we're interested in what evidence was used in the recent relicensing hearings for the Commission to decide the CNL GOCO, also referred to as the Canadian National Energy Alliance, to which SNC-Lavalin and other foreign investors are partners, would be the best future stewards of the CNL site on unceded Algonquin lands and waterways?

We've never been made aware of the business contract between AECL and CNL and we would be interested in what that business contract in fact looks like.

The next point is:

Is the CNL licence decision being reviewed yearly by the Commission in the context of the SNC-Lavalin political interference scandal in seeking a special Deferred Prosecution Agreement through the PMO?

We're unclear of what these other business interests are at the site and how that affects the licence and future of the licence, and having these entities engaged on Algonquin territory without free prior informed consent.

I was listening to Mr. Legree's comments

about the high-risk classification on certain inspections and subsequent enforcement actions at Canadian Nuclear Laboratories and I guess the main question is:

Is CNSC staff monitoring key performance indicators for conventional health and safety for the number of recordable lost-time injuries and fitness for service events that occur at CNL per year in the context of the private contractors operating for profit at the site?

And I also heard him mention self-inspection. So it's just a question of a business entity operating and does it in fact affect these high-risk results.

The last slide we have is about building new rules.

Going forward with a nation-to-nation relationship between the Canadian Nuclear Safety Commission and Algonquin communities, it's something that urgently needs to be structured.

We are requesting that the Commission enters into a consultation, conflict and collaboration analysis that could potentially lead to a consultation framework agreement between our community and other members of the Algonquin Nation.

Then we had an additional request about

regrouping on the environmental assessment processes that are currently going on under previous pieces of legislation.

Thank you.

THE PRESIDENT: Thank you. Again, thank you for coming today and making your submission.

Before I open it up to the Commission Members for their questions, again, you know, you've included in here things around the environmental assessments and, as you yourself said, that's not within the scope of today's discussion or the last relicensing that was done of the Chalk River site.

But maybe I can ask staff to comment on what you have put in here about building the nation-to-nation relationship and in particular in the context of a consultation framework and what our thoughts are on that and how we're proceeding on that and then we'll open it up for questions. So maybe CNSC staff.

MS MURTHY: I would like to ask Adam Levine from the Policy, Aboriginal and International Relations Division to respond to this question.

MR. LEVINE: Thank you.

Adam Levine, Team Leader, Indigenous Relations and Participant Funding, for the record.

We are absolutely committed to working with Kebaowek and the other Algonquin Nations on establishing a meaningful nation-to-nation relationship. We've begun dialogue with Kebaowek through Rosanne and her colleagues at Kebaowek to discuss what this looks like. We're very happy to see Kebaowek getting involved in CNSC regulatory processes and we're going to start sitting down in the coming weeks to map out where we're at in these different ongoing environmental assessments that they're interested in and to make sure that the process moving forward is meaningful for them and that they're able to have their concerns heard and that their rights and interests are reflected in the work that we do and in the information that comes before the Commission. So that work is starting and I think we'll be getting really positive results working collaboratively together moving forward.

THE PRESIDENT: Thank you.

Dr. Lacroix?

MEMBER LACROIX: Concerning this submission?

THE PRESIDENT: Yes, concerning this submission. Any questions? No.

Dr. McKinnon?

MEMBER MCKINNON: No questions.

THE PRESIDENT: Dr. Berube?

MEMBER BERUBE: Well, first of all, thank you for coming. We appreciate having you here and it's important to hear your voices, so thank you for expressing your sentiment and your feelings on the matter. It's deeply appreciated.

If you could help me just to get an understanding of what you really mean by duty of care. How would you describe that in a succinct way? How would you actually get this across? What do you think duty of care really is?

MS VAN SCHIE: Duty of care has really been, from my understanding working with the Algonquin communities for so many years, is that it's not written in French or English; it's written on the land and it's taught by the Elders and it's taught by the experience of how you care for things versus conventional management.

So they see the earth as alive, whether it's the animals or the birds or the waterways. And they're always concerned about how it's cared for versus like conventional management practices that we see in regulatory legislation. And it's a deeper connection with the land, and it's like how you care for your family versus managing your family, like it's probably the best way I can

make that comparison.

MEMBER BERUBE: Just a little definition too is how do you actually define customary law? It obviously comes in with duty of care, but I'm just not sure how that's connected and how you define that.

MS VAN SCHIE: Customary law is kind of a new area of Canadian jurisprudence. And so the Elders bring stories to the landscape, and the stories kind of set the law of how you would interact with the landscape. And so there's certain mythological heroes of customary law. Like you'll see them in the pictographs, like Nanabush is one of these characters. You'll often see him with rabbit ears, and so he's half human, he's half animal. And in being half human, half animal, he understands those two worlds and he can transform between them.

So I mean, customary law is a complex order and it's -- it orders the landscape as well in their own classification system. So they'll put an apex predator up really high, like wolf, and you know, they'll have a lot of respect for wolf and they won't hunt or shoot wolves in customary law because wolf organizes the landscape below wolf, and all the ecosystem structure beneath. And you see that proven in the Yellowstone Park exercise where they reintroduced wolves.

So if you start exploring customary law, then you find out all these relationships and how everything was connected. And if you want to call it, it's like Indigenous science, yeah.

MEMBER BERUBE: Just one final question. This has to do with current land use right now close to Chalk River labs. What are your people actually doing in this area right now?

MS VAN SCHIE: So the Chalk River Nuclear Facility has been closed off to access on site probably since the 1940s. And so that was one of the many displacements on the territory that the Algonquins experienced. However, the waterway remains accessible to all the members, and fishing is of primary importance. So and also all the tributaries that flow into the Ottawa are important. So people use these tributaries for traditional use and, you know, it's the waterways are very important.

And I think that's one of the main issues with the Algonquin people is the location of that site. You know, it's actually right on the Ottawa River. So it really puts the Ottawa River at risk. And there is customary law stories around the Ottawa River that are quite interesting, yeah.

THE PRESIDENT: Dr. Demeter?

MEMBER DEMETER: Thank you very much for your intervention. I find it very informative and learned new things, which is always good.

The first quick question, Chalk River's been there for a long time. Your Nation's been there for a much longer time. Has the Nation presented or involved with the Commission previously to this hearing?

MS VAN SCHIE: Thanks for that question. No, this is the first engagement.

And I'm actually not a member of the Nation. I just work as an advisor with Kebaowek First Nation and other nations that are members of the overall Algonquin Nation.

The Algonquin Anishinabeg Tribal Council has absolutely been engaging at certain levels with the staff at the Canadian Nuclear Safety Commission on these environmental assessments. But what I've mentioned to the staff is like there are a lot of procedural details that the Nation doesn't have the capacity to engage with, because it's set up in a very complex way, a very systematic way that really isn't a good fit. And so you know, I was talking to Adam and his colleagues earlier about kind of regrouping around capacity-building, around the new *Impact Assessment Act* and your Act and how the

hearings work and how to better engage.

But there's definitely a disconnect, you know, between the people on the ground using the waterways, you know, creating these land use and occupancy maps and so on and so forth from the structure of this Commission and how it operates.

So I hope that answers your question.

MEMBER DEMETER: It does, because it raises a second question I have. Is there -- given the sort of ongoing low-level interactions in the past, I was wondering if there was something acute that happened or critical that raised the concern to the point of coming before the Commission. Is this based on a specific concerning mandate? Or is this sort of, okay, we need to get involved now more in a more formal way? I just was -- the timing, I was just curious what drove the timing.

MS VAN SCHIE: Yeah, I think the acute point was the relicensing too in a sort of collaboration between industry and government rather than just government. And the idea of the commercialization of the waste and commercialization of other activities there and what that means, like, 3,000 years from now or, you know, after investors leave or things play out. You know, what is the future we're creating here, and how can the

Algonquins be better involved? Like who are the best stewards of the Ottawa River watershed?

Like their concerns are with the watershed. Ideally, they would have preferred the whole industry or site was in at a hard rock base somewhere, nowhere near water. But it's right on that waterfront. And when the relicensing occurred, it sort of relicensed that facility to continue to be right on the water and operating, where it would've been nice to just move it to some -- a good hard rock location.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: Okay, thank you very much for your intervention. And as I'm sure Mr. Levine has told you, the CNSC is absolutely committed in establishing long-term nation-to-nation relationship. And I'm sure we'll be seeing each other a lot more often in the future.

So we'll move to the written submissions. And Marc, if you can guide us through that, please.

MR. LEBLANC: Thank you.

CMD 19-M24.2

Written submission from the Algonquins of Ontario

MR. LEBLANC: So the first written

submission is from the Algonquins of Ontario, as outlined in CMD 19-M24.2.

Any questions from the Commission Members on this intervention?

Dr. Demeter?

MEMBER DEMETER: I think I have the right intervention. There was a question in the intervention about how the representative person is picked relative to public dose. And maybe that needs to be clarified so people understand the methodology for that.

MS MURTHY: Kavita Murthy, for the record.

I will ask CNL to respond to this question, and then if there's a need we'll have time so we provide more information.

MR. BOYLE: Hi, Phil Boyle, for the record.

I think George Dolinar, our director of Environmental and Radiation Protection, who's the closest to this particular question, is the one to answer it. So George, can you comment, please?

MR. DOLINAR: George Dolinar, for the record.

So we apply CSA standards to most of the work that we do in the environment. So for example, the

CSA standard on calculating derived release limits requires us to look at the impacts we have on local populations. So it's a very prescribed method, I guess, is how I would describe this. But we go a little bit over and above that in terms of some of the assumptions that we make.

A number of years ago we conducted a household survey, visiting -- physically visiting households in close proximity to the Chalk River site. And from that, we extracted information via a questionnaire on what their dietary consumption habits were, you know, did they use a kitchen garden, were they harvesting local foodstuffs from forests like mushrooms and so on.

The point I want to make on this is we didn't explicitly break out any Indigenous diets, but we did by way of the study there were Indigenous individuals included. So implicit in our data we cover some of the non-traditional diet information and certainly the more traditional diet information is part of our process as well.

So once we've looked at occupancy factors, how long you're in your home, how long you're outside your home but on your property, what you're eating, you know, then through a combination of environmental monitoring and effluent monitoring, again applying CSA standards, we can

determine the potential dose consequence associated with that.

I should mention as well just maybe for completeness is that our impact by way of looking at our effluents and assessing the impact through measurement of contamination potentially and produce and water and air, you know, we're at a very small fraction of the regulatory dose limit.

MEMBER DEMETER: And does that methodology take into account that the -- at the end of the day, when you take all your derived release limits and the dietary habits, that the representative person is the most sensitive, the youngest, like pediatric, that kind of thing as well?

MR. DOLINAR: George Dolinar, for the record.

Correct, it looks at different age groups as well, yes.

THE PRESIDENT: Very quick question. Can you share with us when you expect the HEU repatriation to be complete?

MR. BOYLE: The current schedule would have it complete within the first half of next year.

THE PRESIDENT: Thank you.

CMD 19-M24.3

Written Submission from the Municipality of Port Hope

MR. LEBLANC: The next submission is from the Municipality of Port Hope, as outlined in CMD 19-M24.3.

Are there any questions from the Members on this submission?

Dr. McKinnon?

MEMBER MCKINNON: This is a question to CNSC staff. There was a mention that some residents would wish to forego the complete remediation, for example by leaving impacted trees; however, has the contamination issue been clearly discussed with the public? Are they ignoring something important by making that request?

MS MURTHY: Kavita Murthy, for the record. The direct dealings with homeowners is something that CNL and the Municipality are engaging in, primarily CNL. But the properties that have been identified as requiring remediation where -- or potentially requiring remediation where the landowners have not expressed a desire for it to be cleaned up is a particular challenge.

I think that we are looking to work with

CNL to resolve, but I'll ask Scott Parnell to provide more information.

MR. PARNELL: Thank you, Kavita.

Scott Parnell, for the record.

We do a lot of interaction with the community. We have a very strong community engagement process. And as we get to work with homeowners preparing to do the remediation on their homes, their yards, the feedback we're getting from them is we have members of the public who would -- you know, I planted this tree with my father. I would like to keep this. Is there any way I can keep this?

And right now, our current process is either you let us onto your property and we clean it up -- all up, or we don't come on at all.

So we're entertaining with communication with the Municipality, with CNSC the opportunities to potentially leave some of that waste in place. We feel that overall we will get a better, more complete cleanup by going down a path like this and telling someone all or nothing, because we have had people who have said, If you can't leave this, I don't want you on my property.

So we haven't resolved the entire issue. We're actually going through a community involvement

process right now. We've had one community private group session. We expect two more leading up to a community involvement session in end of February -- or in the end of November, I'm sorry.

MR. LEBLANC: Any further questions from the Members?

If not, we'll go to the next submission, which is a submission from the Manitoba Metis Federation as outlined in CMD 19-M24 -- oh, I missed one. Sorry.

CMD 19-M24.4

Written submission from the Power Workers' Union

MR. LEBLANC: The one for the Power Workers' Union as outlined in CMD 19-M24.4

Are there any questions from the Members on the Power Workers' Union submission?

CMD 19-M24.5

Written submission from the Manitoba Metis Federation

MR. LEBLANC: So then we'll proceed with the Manitoba Metis Federation's submission as outlined in CMD 19-M24.5.

Any questions from the Members on this submission?

President Velshi?

THE PRESIDENT: One of the requests made by this intervenor was that CNL should provide safety reports to the MMF. Can CNL comment on that? What are these reports and are they accessible to the intervenor?

MR. BOYLE: Phil Boyle, for the record.

I'd like to ask Mitch MacKay, who is our ERM Stakeholder Relations manager to comment on this. Mitch?

MR. MacKAY: Yes, hello. It's Mitch MacKay, for the record, manager of ERM Stakeholder Relations.

Yes, we're aware of the request and we're working with Manitoba Metis Federation over the next several weeks to get together and talk about how we're going to work to get that request to them as well as other requests that have come forward in their submission.

THE PRESIDENT: Just give us a bit more detail on this particular request. What will be the reason why you wouldn't share it? Is it because you just want to get a better understanding on what it is that they want?

MR. MacKAY: Yeah, Mitch MacKay, for the

record.

That's correct. It's better to meet face to face to discuss these sorts of requests so that the proper context and the proper information can be shared.

THE PRESIDENT: Staff, is this something you're keeping your eye on? Because we wouldn't want to wait for another year and then find out that they didn't get what they really needed in order to be confident that things are being well managed.

MS MURTHY: Kavita Murthy, for the record.

Through our continuous engagement with Manitoba Metis Federation, we do plan to have regular meetings with them to understand information requests that they have. With respect to this particular one, we have the environmental monitoring results as well as the independent environmental monitoring results, which are publicly available and we are always open to discussing with them the significance of the results.

I wonder if Adam Levine has some more information that he'd like to add?

THE PRESIDENT: Yes, it's not the IEMP, it particularly was around the safety reports and why they wouldn't be made available. So I don't know if, Mr. Levine, you had anything else to add. But I'm reassured

that you will be keeping an eye on it. Thank you.

MR. LEVINE: Sure, I'll just -- Adam Levine, for the record.

Just quickly, we actually have monthly teleconferences with CNL and Manitoba Metis Federation where we actually have a structured list of all the requests and different action items. So this is one of them we're keeping an eye on and making sure that it's done in a reasonable time and manner.

MR. LEBLANC: Any further questions on this submission? Not.

CMD 19-M24.6

**Written submission from the
Canadian Environmental Law Association**

MR. LEBLANC: So we're going to proceed to the next submission, which is from the Canadian Environmental Law Association, or CELA, as outlined in CMD 19-M24.6.

Any question from the Members on this submission?

Dr. Demeter?

MEMBER DEMETER: I think this would have

fallen into the general one, but they brought it up as well.

So they raised the question of the fuel cycle program risk classification, and that's Table 1 on the submission. And what I didn't see in that column of the risk classification was a reference. I wondered if this risk classification is a methodologically established risk classification that if I gave it to three independent people and they went through the facility, they'd come up with the same answer? I didn't get that sense of confidence from the document, that that classification system is based in an IAEA document or -- so just give me some clarification on that risk classification program and whether it's reproducible independently with different people looking at the same data.

MS TADROS: Haidy Tadros, for the record. I'm the director general of the Directorate of Nuclear Cycle and Facilities Regulation.

And the question is very pertinent, because this is not our first attempt at looking at a risk classification across the fuel cycle facilities within this program. There existed previous to the efforts that we put forward in 2017-2018 to get an updated risk classification.

The reference is indeed a CSA standard.

It's risk-informed decision making, and that was part of the reference that was used in previous risk assessments that were put together for facilities that existed at the time across the fuel cycle facility.

Now, with that said, the CSA standard does provide a process, a methodology by which to go through this. And in this specific case, when we looked at an update to the risk assessment that we performed on current facilities to establish a baseline compliance plan across those facilities, we did take a deeper dive into certain areas of the approach that is presented with regards to considerations for strategic performance indicators. And that's why you see the RP, EP, conventional health and safety as the main drivers that bring forward the risk-informed program that is in place to provide a bit more consistency across all the facilities within the fuel cycle program.

So it is a CSA standard and it was updated with regards to risk-informed decision making.

MEMBER DEMETER: And are there any other comparable international standards like outside of CSA or -- this is a made in CSA risk classification, but is there other ones that would --

MS TADROS: Haidy Tadros, for the record.

I believe there is. I don't have the name for it. I think it's an ISO standard, but I will try to get the reference for you that the CSA across all these standards organizations that use the same methodology. I will try to get the reference from the ISO --

MEMBER DEMETER: Okay, thank you very much.

MR. LEBLANC: Any further questions?
Dr. Berube?

MEMBER BERUBE: The intervenor here, CELA, has actually stated on I guess page 14 of the submission here that they're concerned about the climate change resiliency of the facilities under question, I guess all of them.

And CNSC, could you give us an understanding of how climate change models actually factor into the long-term stability of the sites and their susceptibility?

MS MURTHY: Kavita Murthy, for the record. I'll ask the director of Environmental Risk Assessment Division to respond to the question.

MR. McALLISTER: Thank you. Andrew McAllister, director of the Environmental Risk Assessment Division.

Really, climate change is looked at in a number of different facets. But really from the sort of resiliency of the facilities in question, it's through sort of safety analysis and examining of external events and what impacts they may have on the safety of the facility.

For example, the Chalk River site has looked at extreme precipitation events, flooding, seismic, those aspects. So obviously flooding and extreme precipitation event's more relevant from a climate change perspective.

And certainly any new project you've heard mentioned of different environmental assessments underway, certainly climate change considerations are looked at under those processes as well.

MR. LEBLANC: Thank you.

Any further questions?

Dr. McKinnon?

MEMBER MCKINNON: I'd like to follow on the same topic, because I noticed in the heavy rains in 2017 and 2018 that both the old and the new water treatment facilities were used, so the old one had to be brought back online because of the heavy rain.

So in relation to the last question, has there been a reassessment of what the sort of design storm

or design capacity for the water treatment facilities would be? And is the plan still -- is it the plan to shut down the old water treatment facility?

MR. BOYLE: So Phil Boyle, for the record.

I believe, Doctor, the situation you're commenting on relates to Port Hope and Port Granby water treatment facilities, so I would ask Scott Parnell to comment on that.

MR. PARNELL: Scott Parnell, for the record.

If you noticed in the earlier presentation, the additional water storage capacity that was added at both Port Granby and Port Hope water treatment plants.

At the Port Granby site, we added eight additional 6,000 cubic metre storage tanks to address the additional water capacity. Part of the problem we had with that, we had open excavations as we were doing the remediation, which pumped up to that area also. As we were finishing that area up, we were collecting less water. And as we're putting a cap over the actual mound itself, we'll continue to collect less water. So we're not addressing it from a climate but from a storage capacity and increasing the capacity of the actual facility itself.

At the Port Hope project, we went from about a 17,000 cubic metre capacity storage pond to a 50,000 cubic metre capacity storage pond to help with that storage involved. So a lot of improvements at that facility to increase the capacity, the throughput of that facility.

MR. COTNAM: Shaun Cotnam, for the record.

As chief regulatory officer, I'd like to enhance what Mr. Parnell said in the sense that as Scott put these water contingency plans into place, this ties directly into the notification provision of the 3.1.2 reporting REGDOC where, for example, this spring Scott's folks looked ahead and saw there was very heavy rain forecast, and they actually gave notification to CNSC staff -- not reportable notification to indicate that we were going to activate our water contingency plan, which meant activating the old waste water treatment plant as extra capacity.

MR. LEBLANC: Any further questions from the Members? No? Thank you.

MS TADROS: Haidy Tadros, for the record.

I just would like to go back and answer, Dr. Demeter, your question.

The ISO standard is 31000. It's the one

on risk management. And there's also the ISO 31010 on risk assessment. Those are the sort of the correlations with the CSA standard on risk management and risk-informed decision making.

MEMBER DEMETER: Thank you very much.

MS TADROS: Thank you.

MR. LEBLANC: So we will now proceed with the next submission, which is.

THE PRESIDENT: Shall we take a break?

MR. LEBLANC: Oh?

THE PRESIDENT: Shall we take a break?

MR. LEBLANC: Oh, sorry. Yes, we are due for a break at this hour. So 10 minutes and we'll start again at 15:00.

--- Upon recessing at 2:52 p.m. /

Suspension à 14 h 52

--- Upon resuming at 3:01 p.m. /

Reprise à 15 h 01

CMD 19-M24.7

Written submission from

Lake Ontario Waterkeeper and Ottawa Riverkeeper

MR. LEBLANC: We are ready to resume. So if you can get back to your seats please. Thank you.

The next submission is from the Lake Ontario Water Keeper and Ottawa River Keeper as outlined in CMD 19-M24.7.

Any questions from the Members on this submission? Dr. Berube.

MEMBER BERUBE: Given the recommendation 27, the request here is for data pertaining to fish impingement and entrapment from CNL. First of all, is that something that's being recorded and would that be information that could be published?

MR. BOYLE: Phil Boyle, for the record. I'll have George Dolinar, the Director of Environmental Program, respond to that.

MR. DOLINAR: George Dolinar, for the record. So information on fish impingement and entrainment

for our intake is available at present on the CNL website, it's in a report, the environmental risk assessment which was just updated at the end of 2018 and submitted to the CNSC in 2019.

That's available on our website. I don't recall the specific section, I could certainly look it up. But information on impingement in terms of numbers, biomass, species, is all available online at present.

MR. LEBLANC: Madam Velshi.

THE PRESIDENT: So again, on information and making it readily available, maybe I'll start with Staff and then move to CNL because I think I know what Staff's answer is going to be.

Are all the licenses available on our website?

MS MURTHY: Kavita Murthy, for the record. No, they are not. They're available on request. The ones that are available on the website are the nuclear substance and Class 2 nuclear facility licences. We do send the licence and licence conditions handbook as soon as we get a request for those.

THE PRESIDENT: CNL, are the licenses available on your website?

MR. BOYLE: When you ask if the

licensees --

THE PRESIDENT: The CNSC licence that you have.

MR. BOYLE: Hold on a moment. No, we do not publish it on our website.

THE PRESIDENT: Why do you not have them on your website?

MR. BOYLE: I think the answer to that is similar to some of the other documents that are not on the website, and that is that if there's some particular interest that an individual has, we'd like to understand that interest to be sure we answer their question as oppose to providing lots of information, but not knowing quite how people are interpreting them.

So we would make the licence available to a requester.

THE PRESIDENT: Yeah, I think the whole philosophy is don't wait to ask, you know, intervenors have 30 days to respond to things, and while they're waiting for you or us or Staff to respond, you know, the clock is ticking. Correct me if I'm wrong, Staff, we don't have those on our site because we have a requirement to have them translated in French, you don't. We could easily put a link on our website so they could go to yours and get

them readily. Is that a difficult request?

MR. COTNAM: Shaun Cotnam, for the record. I think, President Velshi, you're talking about the CNSC licenses, is that correct?

THE PRESIDENT: That is exactly what I'm asking about.

MR. COTNAM: So I'm going to admit I'm a bit confused, because we don't normally post other people's documents. We might put a link --

THE PRESIDENT: No. No, no. Just the licenses that have been issued to you.

MR. COTNAM: Correct. But that's a CNSC document, they own the licence, we are granted its use. But it's actually CNSC, the Commission's, document.

THE PRESIDENT: So the CNSC licence is not available on your workplace -- I mean, there are many licences you have that people post, right? I mean, I'm kind of surprised to think that it's CNSC intellectual property and you can't have it on your website.

MR. COTNAM: Shaun Cotnam, for the record. Let me try it this way. Internally, we absolutely have a licence website where we have all our licences, not just CNSC, but obviously CNSC dominates. At any one time we may have 30 to 32 CNSC licences when you include the

transportation licence, we have a dosimetry licence, et cetera. Those are all posted internally and, in addition to that, we have obviously the LCHs.

I thought you were talking about an external posting. This is actually the first time we thought about putting up the licence that's owned by the Commission and granted to us on our own website.

THE PRESIDENT: Okay. Clearly, we need to do a bit more thinking around this. Thank you.

MR. COTNAM: We do post it, Madam President, at entrance to each one of our licence sites as per the regulations of course.

THE PRESIDENT: Right. I mean, I've seen them, that's what I mean. They're out on your workplace, why would they not be on your website?

MR. BOYLE: I would like to take that for action. We'll take that.

THE PRESIDENT: Thank you. Then once you have it, we can just put a link to your website and just make life easy for everyone.

MR. LEBLANC: Further questions? Dr. McKinnon.

MEMBER MCKINNON: There was a comment by the intervenor that there is a tritium plume originating

from the NRU reactor site at the Chalk River complex and also a strontium plume from Waste Management Area A and plumes from Waste Management Area B.

So my question I guess to CNSC Staff would be, have these been monitored at all or picked up? Is there a health and safety hazard of these? Are they being sampled at all?

MR. McALLISTER: Andrew McAllister, the Director of the Environmental Risk Assessment Division. So, yes, we are well aware of the various plumes, in groundwater various contaminants. They have been -- delineation has happened, there is the groundwater monitoring that happens, reported on an annual basis.

What we have sort of generally noted around those plumes and the concentrations thereof is that trends are generally stable or decreasing.

Then, lastly, those groundwater discharge points into sort of surface waters, et cetera, do get captured in the overall environmental risk assessment for the site.

So we're satisfied with the means by which those plumes have been examined to date and how it gets captured in sort of their overall environmental monitoring program and then subsequently into their risk assessment.

MEMBER MCKINNON: Okay, thank you. They were mentioned, but there was no details given, so which is why I asked. Thank you.

CMD 19-M24.8

**Written submission from the
Canadian Nuclear Workers' Council**

MR. LEBLANC: Any further questions? No. So we'll go to the next submission which is a submission from the Canadian Nuclear Workers' Council as outlined in CMD 19-M24.8.

Any questions from the Members? No.

CMD 19-M24.9

**Written submission from the
Concerned Citizens of Renfrew County and Area**

So we'll go to the next submission which is a submission from the Concerned Citizens of Renfrew County and Area as outlined in CMD 19-M.9.

Questions from the Members? Dr. Demeter.

MEMBER DEMETER: I think we need to respond. On their document, which is page -- there's no

page number, it's 6 of 39, their bullet 10, I think we need to clarify that this -- I won't put words into your mouth, it's probably not the CNSC Staff's position, but at CNSC we consider its opposition to the mandatory environmental assessment of new nuclear reactors and recommend such assessments be required. I don't think that's the position, but I'd let you clarify that for the record.

MS CIANCI: Candida Cianci, for the record. So, indeed, it's not our position. We will adhere to the current regulatory framework that we have which includes the *Impact Assessment Act*. That went through an extensive public consultation process.

It is the Government of Canada that determined what types of projects, as we discussed yesterday as part of the NPGS ROR in terms of what types of projects would require an impact assessment.

MEMBER DEMETER: Thank you.

MR. LEBLANC: Other questions? No. Madam President, this was the last of the submissions.

THE PRESIDENT: Okay. Then we'll open up for any other questions the Commission may have.

Maybe I'll start off and ask CNL, in your opening comments you talked about all your activities underway and planned. But you didn't comment on what you

thought of CNSC Staff's assessment of your performance for 2018. Do you concur with it? I think it would be kind of good to hear your perspective on that.

MR. BOYLE: Thank you for the question, Madam President. I should have acknowledged that we do concur with it, we certainly went through it in detail. There's been a lot of communication between CNSC Staff and CNL management and our workforce in fact. So I think it would be surprising if there was a mismatch of any significant degree, and I don't think there was at all in this one.

THE PRESIDENT: Thank you. I just wanted to confirm that.

So we'll start with Dr. Berube.

MEMBER BERUBE: Just a follow-up on that question. Do you find the ROR process beneficial to CNL operations?

MR. BOYLE: We do find it beneficial. I mean, it's always advantageous to sit back and read a kind of complete assessment, you know, instead of this piece and that piece, and you conclude that there's some overall concept or matching of views. But we find that to be able to sit down and read this from start to finish, all the different areas rated, it's helpful.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: Yes, I have a question about the Port Hope area. In the report there was apparently some open actions related to the installation of the baseline system for part of the long-term waste management facility.

What is that system comprised of and how is it inspected and measured?

MS MURTHY: I'll ask Rob Buhr, the Senior Project Officer, to respond to this request.

MR. BUHR: Hi, Rob Buhr, for the record. I'm the Project Officer for the Port Hope area initiative. We had conducted an inspection in October 2018 and by the time the inspection reports are completed and all the assessments it exceeded the time when we'd expect to see and also respond to the inspection report at the time we were writing the regulatory oversight report.

So since that time all of those actions resulting from that inspection have been closed.

Just a follow-up on your question, your second question about what we inspect. Essentially at the time the licence was issued there was design requirements for those long-term waste management facilities. So we go through the specifications that were provided at the time

and make sure that the design is met with the actual -- I guess what you observe in the field.

So we're looking at those specifications that were initially submitted to what the actual final product looks like.

MEMBER MCKINNON: What is the long-term monitoring system comprised of for monitoring any potential leaks from those facilities?

MR. BUHR: So the main component is looking at the groundwater monitoring to ensure that any leachate from the waste that's contained within the mound isn't escaping the engineered mound. So there's a series of groundwater monitoring wells surrounding the facility, and we look at the results from those, which are provided annually by CNL to make sure that the mound is intact.

MEMBER MCKINNON: Okay, thank you.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: In the CMD document M24.A, on slide 21, then if you go down to slide 54, both slides express some reticence or reluctance among workers to raise safety and non-safety issues.

This is disconcerting in a sense that is it indicative of the relationship between the employer and employees at CNL and what are these reticences and

reluctances, and what are these safety and non-safety issues?

So could Staff expand on this matter? Then I would like to hear it from CNL.

MS MURTHY: So you're talking about the focused inspections that were conducted at CNL sites. As a part of that inspection there were a large number of CNL staff who were interviewed. Where we did not find a concern about people being able to raise safety-related concerns some of those conversations gave us an indication that there was some reluctance among some people to generally raise issues.

Now, we take very seriously -- we think that these are all important indicators of some aspect of safety culture and some aspect of employee/employer relationships that might need further examination.

I can't point to you the specific concerns that were raised, but we did see those as a big enough concern that we did ask CNL to conduct a safety culture self-assessment and tell us about these results, and CNL is aware of these issues and they will be focusing in their own assessment of that.

Perhaps Phil Boyle would like to give you some details about that.

MR. BOYLE: Thank you. Phil Boyle, for the record. So we took the observation quite seriously also. I would point out that we have done a safety culture assessment as requested. We utilized a third party from one of our parent companies who does this professionally. They utilize the methodology of the CNSC REGDOC, which rates the maturity in various areas. So that was very helpful.

We also brought in a team from one of our other parent companies of managers who have managed similar organizations to the Chalk River site. They spent a week looking at how we operated, whether we had a good idea of what our employees felt about things and what our plans were to improve.

I want to point out that initially when one hears that there was a reluctance to bring up issues that may be a view that there would be somehow retribution or management would punish people for bringing up good ideas. One of the things that came out of the safety culture assessment is that there was a sense that concerns that had been raised had not been addressed, so why bring them up again is the kind of thing.

Now, these were not safety-related concerns. I want to point out that that was acknowledged

by staff, and we found the same thing. But we clearly have work to do in the area of responding to workforce concerns.

The performance of any organization is the performance of the workforce, and if the workforce doesn't think they can tell management about areas that need to be improved, and we will react, then you're never going to be a high-performance organization.

Now, we had a number of actions underway over the last year or so prior to either of these reviews in the area of safety culture improvement. As a result of these reviews, we've added a few more. I've been personally involved in most of those. Had a lot of time with individual workers. I'm satisfied we're on the right track.

I think our condition, especially as it relates to safety, is not one of an unsatisfactory condition right now, but we clearly have an opportunity to get better. That's what we're working on.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you. This will be for CNL. In CNSC Staff's Appendix E which deals with NEW, nuclear energy worker, doses, in each of the sites it speaks to non-NEW, non-nuclear energy worker, doses, all being very low.

Am I to surmise from this that all your non-NEWS are badged or have electronic dosimeters as well or is this a sample, then you're extrapolating? But I just was curious about the methodology for the non-NEW dosimetry results.

MR. BOYLE: Certainly. Phil Boyle, for the record. I think, again, George Dolinar will give you the most precise response to that. George.

MR. DOLINAR: George Dolinar, for the record. So it's a combination of both sort of categories that you identified. So in some instances we will badge visitors to the site, which are non-nuclear energy workers, and so we'll have a recorded dose as a result of that.

In other instances we'll have visitors to the site that have a particular duration on the site and then they get assigned a dose based on that duration from a series of TLDs we have mounted around our facilities on which we base those estimates.

MEMBER DEMETER: So do you have any permanent on-site employees such as support staff, administrative staff that are considered non-NEWS or do you designate one as an NEW? You talked about visitors, but does this include also CNL staff that are non-NEW?

MR. DOLINAR: George Dolinar, for the

record. Historically, any employee that became, you know, a CNL employee also became an NEW. Now we have -- and I'll try to be clear here, but it might take a moment -- we have contractors on site, and so some of those contractors are there for a period of time, and not all of those contractors will be considered NEWS. Because we don't expect them to get any significant dose or anything close to 1 mSv, so by regulation there's no requirement for them to be NEWS.

So, you know, people are indistinguishable from one another, but we will have contractors that spend time on the site that are not NEWS, some contractors will become NEWS.

There may be some employees now that are not NEWS. I need to be clear on this as well. So when you talk about Chalk River, for example, we have people based in Deep River, which are considered chalk river employees, but they may never come to the Chalk River site or very rarely, and when they do, they would get a visitor TLD.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: This question's for CNSC. I'm very curious as to, because of the volumes of waste that we're handling now, and actually the volumes are going

to increase, one of the things that's been puzzling me is, you know, how do we records tracking verification on waste management at the CNSC level and, second of all, do you ensure that basically these records are also maintained offsite, a separate location for purposes of redundancy and back-up?

Because, obviously, it's really critical that we maintain these records intact for a very long period of time.

MS MURTHY: Kavita Murthy, for the record. I'll ask Karine Glenn from the Waste Decommissioning Division to talk about the volumes of waste with respect to the records being maintained offsite. I would expect that CNL would be able to give us a response to that. I'm quite sure they have a back-up system.

While Karine is getting settled, why don't you...?

MR. COTNAM: Shaun Cotnam, for the record. So, yes, we do have a waste management, essentially a database that we record all this. We also have bar coding now that's tied to that as we have started to modernize our approach to that.

So those records are maintained, we do have back-up to that, and we've used that database since

the 1980s, so it's been revamped and it actually is scheduled to be replaced by a new database.

MS GLENN: Karine Glenn, for the record. I'm the Director of the Waste and Decommissioning Division at the CNSC.

All licensees that receive waste or that store waste are required to maintain records of that, and that includes the origin of the waste, the characteristics of the waste, the activity of that waste. And so those records are required to be maintained as long as they have that waste in their possession and on an ongoing basis.

So there are provisions in both the CSA standards and the CNSC's new draft REGDOC on waste management with respect to those records and how long they need to be maintained and what needs to be ensured in the future to ensure that those records are still available and retrievable to the -- to future generations for as long as that waste remains a hazard.

MEMBER BERUBE: Just on top of that, do you actually do a physical verification of inventory at some point just to validate the records?

MS GLENN: So Karine Glenn.

Through our regular inspections, we will do spot checking of inventory records. That's definitely

something that all the inspectors do for all the licensees, and we'll often track -- you know, point out a container and say, "Show me the records for that one. I want to see the inventory in that one".

So we -- that is definitely something that we do, and perhaps I can ask some of the inspectors to add information about the kind of verifications that they have done and what they've found.

MR. BUHR: Rob Buhr, for the record.

So in the case of the Port Hope project, a lot of these -- and, for that matter, the Port Granby project, all the vehicles and trucks that are loaded with waste pass through a weigh scale. That scale then -- the weight of that is recorded and logged and then the truck goes on to dump the load into the mound.

So in the past, as an inspector, I have verified the logs to ensure that the truck weights are being recorded and then the annual totals are reported in their annual compliance report. So when you hear -- heard CNL earlier talking about how much waste they've transferred, that's a result of all of these logs being summed at the end of the year to determine how much waste was placed in the mounds.

MS MURTHY: Kavita Murthy, for the record.

I believe Brett Legree, as the site supervisor, would like to talk -- speak to something related to the Chalk River site.

MR. LEGREE: Yes. Brett Legree, for the record.

We recently conducted an inspection which included waste management at Chalk River, and we had selected a random container in one of the waste storage facilities and requested the records to verify that what was in there was there.

MR. COTNAM: Shaun Cotnam.

Maybe just to further give you confidence, Commissioner Berube, we do, of course, have an off-site separate secure facility called Iron Mountain where we store a lot of the historical manual records from when we began, so we also have those records, a bit dusty, but in retention.

THE PRESIDENT: Thank you.

Dr. McKinnon.

MEMBER MCKINNON: Yes, I'd like to pick up on that comment about dust and revisit the question I had earlier about the Port Hope project.

I was impressed by the volume that you mentioned, which is really significant, of, you know,

material that has to be removed. So how do you stop contamination that's in the ground from becoming an airborne contaminant?

That's not an easy task. I'm sure we've all passed many trucks which are blowing dust and so on.

MR. PARNELL: Scott Parnell, for the record.

There are a couple of ways that we do that, and a lot of that ends up being dust control in the form of water and different types of chemicals that kind of hold that in place. But once we put that inside of a track, there's a tarping mechanism that we have to ensure that's in place meets the Transportation of Dangerous Goods requirements and we have people who follow those trucks around occasionally to validate that we aren't losing any dust out of the back of those trucks.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: I just want to make sure that I understand correctly.

Action levels are established by the licensee and it must be approved by CNSC Staff. Am I right?

MS MURTHY: Kavita Murthy, for the record.

Action levels are proposed by the licensee

and CNSC Staff will review it and accept it or not, so in -- is it a formal approval of a -- it's not considered a formal approval; it's considered an acceptance.

MEMBER LACROIX: Okay. And action levels are site dependent; right?

MS MURTHY: Yes, that is correct. They are activity dependent.

MEMBER LACROIX: Okay. So I've noticed in your ROR that in February 2019 CNL has revised the Port Hope area initiative radiation protection plan, and the action levels -- level, I should say, was raised to 3 mSv over a period of four weeks.

So this is the action level for radon exposure, is it? Am I right?

MS MURTHY: So I'll ask Christina Dodkin, our radiation protection specialist, to respond to this question, please.

MS DODKIN: Thank you. It's Christina Dodkin. I'm a radiation protection specialist with the CNSC.

So regarding your question, the action level of 3 mSv per four-week period is for a total effective dose, so that would be for both the external component and the internal component that would come from

the long-lived alpha contaminants.

MEMBER LACROIX: Okay. So if someone is just at the limit of the action level, 3 mSv, for four weeks, over an entire year, that would be 13×3 . That's 39 mSv per year. Am I right?

MS DODKIN: Christina Dodkin, for the record.

So we'll take a step back in that. So there's an action level over a four-week period, and CNL also implemented an additional action level of 10 mSv per year.

In addition to that, they have levels below that where they are monitoring doses to workers. And on top of that is the ALARA, As Low As Reasonably Achievable, principle which we do enforce as well, and they've implemented ALARA processes to drive doses down even further.

MEMBER LACROIX: I understand. Thank you very much.

THE PRESIDENT: Dr. Demeter.

Dr. Berube?

Dr. McKinnon. You're done.

And Dr. Lacroix.

MEMBER LACROIX: I do have a question for

CNL.

I've noticed in slide 29 from the ROR there's still releases of iodine-131 and argon-41. These are two short-lived radio isotopes, so they must be produced by some facility on Chalk River site, and this facility's a reactor. Am I right?

MR. BOYLE: So before I ask George to give you the best possible answer, I would point out that in 2018 the NRU reactor was still operating for half the year, or excuse me, for the first three months.

MEMBER LACROIX: Okay.

MR. BOYLE: George, do you have more to add on that?

MR. DOLINAR: That's correct.

So NRU was operating up until March -- the end of March in 2018, so what you see is that.

MEMBER LACROIX: Okay. So that means that in 2019 there won't be any releases of iodine-131 and argon-41.

MR. DOLINAR: There won't be any releases of argon-41. Iodine may be a little bit different, depending on what happens in laboratories, and iodine can be brought on site and so on. But argon-41, absolutely, it's zero now. Yes.

MEMBER LACROIX: Okay. Thank you.

THE PRESIDENT: Just a quick comment for staff.

In the executive summary, you don't include the report card, you know, the one-pager that shows the satisfactory rating and so on.

Do you not think that would be helpful to make that more of a stand-alone?

Anyway, something for your consideration.

And then in slide 32 on conventional health and safety, the units are not included, so, I mean, in case you post that or distribute it any further, that will be helpful as well.

I think that takes care of everything.

So again, this concludes the meeting of the Commission. Thank you all very much for your participation.

Marc.

MR. LEBLANC: And if you did borrow interpretation devices, remember to return them and claim your identification card.

Thank you. Bonne fin de journée.

--- Whereupon the meeting concluded at 3:34 p.m. /

La reunion est terminée à 15 h 34