

There were six cases where, based on dosimetry results, a worker may have exceeded a regulatory dose limit. In all cases, the licensees responded in accordance with the radiation protection regulations.

None of the six cases resulted in immediate adverse health consequences to the workers. In all cases, the licensees implemented acceptable measures to prevent recurrence.

In two of the cases, the investigation revealed that non-NEWs had, indeed, exceeded the one millisievert regulatory dose limit.

In three cases, the investigation conducted by the licensee suggested the doses were non-personal, but did not unequivocally demonstrate this.

In the last case, the dose registered on the dosimeter was deemed to be non-personal, and a dose change request was approved by CNSC staff.

Overall, doses remain low, with over 99.9 percent of workers receiving doses below regulatory limits.

In general, compliance ratings for

operating performance continued positive trends in most sectors. The biggest improvement in compliance ratings was seen in the commercial sector. This increase can be directly correlated to a shift in strategy for inspecting licensees in the servicing subsector.

This group of licensees saw their first field inspections in 2012, which explains the drop in compliance in 2012. Licensees now have a greater understanding of regulatory requirements, which has led to a significant improvement in compliance ratings in 2013 when compared to 2012.

For inspections that resulted in ratings below requirements, CNSC staff ensured that all non-compliances were properly addressed and corrected.

In general, compliance ratings for radiation protection also continued positive trends in all four sectors. Non-compliances in this area can range from simple administrative failures such as poor record-keeping to major issues such as loss of control of radioactive sources.

The vast majority of non-compliances

in this safety and control area had no immediate impact on the health and safety of workers. All non-compliances were properly addressed and corrected.

In the few cases where there was an immediate health and safety risk, the CNSC took additional enforcement actions, which are described next.

An order is one of the key enforcement actions used by CNSC. An order must be obeyed by the recipient. Failure to comply can lead to further regulatory measures.

Of the 24 enforcement actions issued to licensees, 22 were orders and two were administrative monetary penalties.

The majority of the orders continued to be issued to the same industrial subsectors as in previous years. The CNSC compliance program in the industrial sector in 2013 paid particular focus on the portable gauge subsector and as a consequence most of the orders issued in 2013 were to licensees in this subsector.

All orders issued in 2013 are now closed. Details of all enforcement actions, including

orders and AMPs are published on the CNSC's public website.

The number of reported events increased from 139 events in 2012 to 150 in 2013. All were assessed by CNSC staff and categorized as low risk.

There were 17 reported events involving missing or found nuclear substances. In nine of the 17 cases, sealed sources or radiation devices were recovered. The remaining cases involved low-risk sources, most of which have decayed to below exemption quantities.

The 17 reported events involving breaches of security are in fact safety barrier breaches. These typically involve people entering a restricted work area established prior to the use of a radiation device or prescribed equipment. All of these events were categorized as breaches -- although these events were categorized as breaches of security, all of them were a result of workers not following operational procedures. No attempts were made to illegally gain access to nuclear substances.

Here is a comparison of reported

events by sector. Reported events generally remained constant in most sectors, with the largest increase in the industrial sector. This was mainly due to an increase in the number of reported events related to safety barrier breaches. Of those, 15 were related to the industrial radiography subsector.

This concludes the overall summary. I will now move on to an overview of each of the four sectors.

Let's begin with the medical sector.

The medical sector included 552 licences and just over 6900 NEWs. Performance results are provided for all licensees in the sector.

Three subsectors are highlighted in further detail. These are: diagnostic and therapeutic nuclear medicine in which unsealed nuclear substances are administered to patients to diagnose and treat medical problems; radiation therapy which uses external beams of radiation or radioactive sources to treat cancers; and veterinary nuclear medicine which uses techniques similar to those employed in human nuclear medicine.

Doses to workers in the medical sector

remained low. Compliance rating for operating performance and radiation protection continued to be good, with increases in compliance ratings demonstrated in both areas. No enforcement actions were issued in 2013.

Here is a breakdown of doses to workers in the medical sector. Almost all radiation therapy workers continued to receive doses below 1 mSv. Nuclear medicine doses are typically higher due to the need to handle unsealed or radioactive sources. Despite this, the vast majority of nuclear medicine workers continued to receive doses less than 5 mSv.

In total, there were 25 reported events in the medical sector. Most of the reported events were related to spills or contamination during the handling of unsealed nuclear substances. This is to be expected given the number of medical procedures in Canada involving unsealed nuclear substances. It is worth noting that the number of reported spills has remained constant since 2011. All reported events were assessed by CNSC staff and categorized as low risk.

Now, we move on to the industrial

sector.

The industrial sector included 1440 licences and almost 9500 NEWs. Performance results are provided for all licensees included in this sector.

Four subsectors are highlighted in further detail. These are: industrial radiography, which involves the use of exposure devices for the non-destructive examination of materials such as pipelines; portable nuclear gauges which are typically used to measure moisture and density in soil and the compaction of asphalt in construction; fixed nuclear gauges which are used to monitor production processes in many industries such as paper mills; and oil well logging where sealed sources or compact accelerators are sent on cables down very deep, narrow bore holes to analyze the geological structure and composition of the bedrock to help locate oil.

Doses to workers in the industrial sector remained low. Compliance ratings for operating performance and radiation protection continued to be good, with an increase in compliance demonstrated in radiation protection.

Although there was an increase in enforcement actions, this was mainly due to a change in the inspection program for the portable gauge subsector. More details are provided on a further slide.

Here is a breakdown of doses to workers in the industrial sector. The vast majority of workers in all subsectors continued to have doses below 5 mSv. As noted earlier, industrial radiography workers continued to incur the highest doses, with 11 workers receiving between 20 and 35 mSv in 2013.

CNSC inspectors issued 22 orders in 2013. As noted previously, most of the orders issued in 2013 were in the portable gauge subsector. Due to the large number of orders in that subsector, CNSC staff have also developed a focused outreach strategy to clarify regulatory requirements and to deal with systemic non-compliances. This is similar to the strategy staff successfully used in the industrial radiography subsector.

Staff believe that positive results from these activities is already evident in the fact that as of November 2014 only three orders have been

issued to the portable gauge licensees. If this trend is maintained, it will be the lowest number of orders in this subsector since 2008.

In total, there were 88 reported events in the industrial sector. All 88 reported events were assessed by CNSC staff and categorized as low risk. More than half of all these were related to malfunctioning or damaged devices. Examples include portable gauges which were hit or run over by vehicles at construction sites or fixed gauges that were damaged after a drop or an impact. There were no reports of sealed sources leaking following these events.

Sixteen of the 17 safety barrier breaches discussed previously were in this sector. All 16 were a result of workers not following operational procedures.

Next is the academic and research sector.

The academic and research sector included 232 licences and just over 9,800 NEWs. Performance results are provided for all licensees in the subsector.

Two subsectors are highlighted in further detail. These are laboratory studies and consolidated use of nuclear substances in which universities, colleges and government laboratories use nuclear substances for research in the fields of biology and biomedicine, and high energy research particle accelerators which conduct research activities that range from subatomic physics and astrophysics to applied research such as investigating alternate methods for medical isotope production.

Doses to workers remained low in the academic and research sector. Compliance ratings for operating performance and radiation protection continued to be good, with increases in compliance ratings demonstrated in both areas. No enforcement actions were issued in 2013.

Here is a breakdown of doses to workers in the academic and research sector. Almost all workers continued to receive doses below 1 mSv.

In total, there were nine reported events in the academic and research sector. Just under half of the reported events were related to spills or contamination incidents. Three events were

related to safety system malfunctions at high energy research particle accelerator facilities. These will be discussed in the section on high energy accelerators. All nine reported events were assessed by CNSC staff and categorized as low risk.

Next, we cover the commercial sector.

The commercial sector included 256 licences and just over 1500 nuclear energy workers. Performance results are provided for all licensees in this sector.

Five subsectors are highlighted in further detail. These are: isotope production accelerators which are used for the production of isotopes in diagnostic medical imaging; processing of nuclear substances for industrial, medical and research purposes; servicing of prescribed equipment, which includes installation and repair of radiation devices as well as the installation and removal of sealed sources; distribution of nuclear substances, which involves the operation of specialized facilities that possess nuclear substances and radiation devices for sale and redistribution to other licensees such as laboratories and hospitals; and calibration, which

uses nuclear substances for calibration of radiation detectors.

Doses to workers remained low in the commercial sector. Compliance ratings for operating performance and radiation protection continued to be good, with increases in compliance ratings demonstrated in both areas. No enforcement actions were issued in 2013.

Here is a breakdown of doses to workers in the commercial sector. The vast majority of workers in all subsectors continued to have doses below 5 mSv.

In total, there are 28 reported events in the commercial sector. More than two-thirds of the reported events were related to minor contamination incidents during the handling of unsealed sources at processing facilities. All 28 reported events were assessed by CNSC staff and categorized as low risk.

For high energy research particle accelerators I will now turn the presentation over to Mr. Jeff Sandeman.

MR. SANDEMAN: Jeff Sandeman, Senior Project Officer, Director of Nuclear Substance

Regulation.

Within the academic and research sector there are two high energy particle accelerator facilities which are subject to additional compliance oversight due to their size and complexity. These are TRIUMF accelerators in Vancouver and the Canadian Light Source in Saskatoon.

TRIUMF actually operates seven different accelerators on its site and it is Canada's national laboratory for nuclear and particle physics research and related sciences. TRIUMF is also a major producer of radioisotopes used for medical diagnostic procedures.

CLS operates a synchrotron facility which is used for experimental research in a wide range of fields, including biology, materials research, atomic and molecular science, and electronics.

The compliance rating for all 13 safety and control areas applicable to these facilities are summarized here. These ratings are based on the compliance activities conducted in 2013, including inspections, review of events reported by

each facility and a review of the annual compliance reports submitted by each licensee.

While compliance in most safety and control areas was satisfactory, some deficiencies were noted in management system and human performance management programs at the Canadian Light Source and the fitness for service safety and control area at TRIUMF. The basis for the below expectations ratings in these areas are discussed in more detail on the following slides.

Each facility was inspected once in 2013. Each inspection involved a multi-person multidisciplinary team from the CNSC which enables an inspection of multiple safety and control areas. The main focus of each inspection is indicated on this slide.

Please note that there is a typo on this slide. There were eight corrective actions required as a result of the inspection at TRIUMF, not seven. Five of these have since been addressed satisfactorily by the licensee.

Of the remaining three items, two are long-term improvements to the training program which

are expected to be completed by the end of 2014. A follow-up inspection will be scheduled early in 2015 to assess implementation.

The final corrective action relates to one of the reported incidents. An acceptable action plan has been submitted and progress is being monitored by CNSC staff.

For Canadian Light Source, 13 corrective actions were required as a result of the inspection. The below expectations grade for the management systems in the human performance management safety and control areas at CLS is a direct result of the findings of the inspection.

Twelve correction actions have now been satisfactorily addressed by the licensee, including the last remaining management system action shown on this slide, which was closed very recently.

The remaining item is a long-term improvement in implementation of a systematic approach to training for all personnel. Again, satisfactory progress has been demonstrated to date and CNSC staff continue to monitor progress via mandatory periodic reporting by the licensee.

The collective dose to all staff working at TRIUMF in 2013 was 144.9 person mSv, a reduction of more than 25 percent from 195.1 person mSV in 2012. This continues a decade-long trend during which collective doses to TRIUMF staff has decreased by 66 percent since 2004. Staff doses are now at the lowest levels they have been since 1979.

At CLS, the collective dose to all staff as well as the individual maximum average doses remained low in 2013. The maximum average doses to both nuclear energy workers and to other workers were all well below the general public limit of 1 mSv per year.

In 2013 there were three incidents reported by these facilities related to the malfunction of safety systems.

CLS has 24 radiation monitoring stations on the site. Each of these stations operates independently and has alarms which sound if the dose rates above a preset threshold are detected. The radiation monitor signals are also sent to the control room.

The incident involved the malfunction

of a device which controls the signal sent to and received from four of these monitors. The control or communication area was detected by the operator and corrected immediately.

The two incidents reported at TRIUMF both related to the malfunction of a safety component of a component of the extensive array of systems that are used to contain and monitor the very low level releases of gaseous nuclear substances via the nuclear exhaust system. Such releases have remained relatively constant at about 1 percent of the derived release limit per year over the past decade. That is equivalent to a dose of about .01 mSv or 1 percent of the general public dose limit to the most exposed person.

In one case, a system designed to contain xenon gas, which is used in the production of the medical isotope iodine-123, failed to fully contain the gas when the target window ruptured. Approximately 10 percent of the total activity was released via the nuclear exhaust, which resulted in a potential maximum dose of less than .005 percent of the general public dose limit.

In the second event, a new calibration technique used by TRIUMF revealed that one of the nuclear exhaust stack monitors had drifted out of calibration, although it was still functional. TRIUMF concluded that the monitor may have been out of calibration for several years, resulting in underreporting of emissions from that particular section of the nuclear exhaust. Subsequent reanalysis of the previous five years' annual airborne release monitoring results indicated that the average annual release over that period still remained below 1 percent of the derived release limit.

In both cases, TRIUMF implemented corrective actions which are acceptable to CNSC staff to prevent recurrence of these types of incidents. However, as a result of the incidents, a below expectations grade was warranted for the fitness for service safety and control area in 2013.

The operating licences for both TRIUMF and CLS include a Licence Conditions Handbook which defines the key documents and compliance criteria related to the facility. Authority to make changes to the Licence Conditions Handbook has been delegated to

a designated officer with a provision that such changes must not reduce the overall level of safety for the facility.

For TRIUMF, multiple changes and updates were combined into two sets of revisions to the Licence Conditions Handbook in 2013. The majority of these changes were administrative in nature and deal with procedural updates and improvements. There were also two minor facility design alterations, both of which were necessary to accommodate new experimental facilities being built on the site.

There were no changes to the Licence Conditions Handbook for the Canadian Light Source in 2013.

Finally, both sites continued to expand their operations to incorporate new facilities for both research and medical isotope production.

At CLS, the Medical Isotope Project, or MIP, involves the construction of a new high power electron linear accelerator facility incorporating a Canadian-made commercial accelerator system to investigate an alternative technology for producing technetium-99m, the world's most commonly used medical

isotope. Construction of the facility was completed early in 2013 and an operating licence to permit commissioning tests on the accelerator was issued under designated officer authority at that time. Commissioning tests were ongoing for the remainder of 2013.

The Advanced Rare Isotope Laboratory, or ARIEL, Project at TRIUMF is also now well underway. This project involves developing a high power superconducting electron accelerator which is being custom designed and built by TRIUMF to expand Canada's abilities to produce and study isotopes for physics and medicine. Facility construction was largely completed in 2013 and in December a licence was issued to test the first major component of the accelerator. Again, this licence was issued under the authority of a designated officer.

So, in conclusion, both TRIUMF and CLS continued to operate safely and in accordance with their licensing basis in 2013. While some non-compliances were noted during inspection of these facilities, they did not present an immediate risk to the health and safety of persons or to the

environment. The majority of the corrective actions required to address these non-compliances have been completed. A few longer-term actions are still underway and progress is being monitored by CNSC staff. Similarly, the incidents reported by these two facilities in 2013 did not result in any adverse radiological consequences to persons or the environment.

The ARIEL and MIP projects at TRIUMF and CLS, respectively, continued to progress and the initial operating licences for testing of these accelerators were issued for both facilities in 2013. Ongoing licensing and inspection of these two new facilities will be a regulatory priority in 2014.

I will now turn the presentation back to Mrs. Kavita Murthy for her concluding remarks.

MS MURTHY: Thank you, Jeff. Thank you, David.

Kavita Murthy for the record.

Staff conclude that licensees continue to maintain appropriate safety programs which include appropriate measures to protect the health and safety of Canadians as well as the environment. Licensee

operations are safe, with adequate regard for health, safety and security. Licensees ensured that there is acceptable protection in place for the health and safety of persons with respect to ionizing radiation. Doses to workers remain low. Overall, the use of nuclear substances in Canada continues to be safe and responsible.

This concludes staff's presentation of the CNSC staff report on the use of nuclear substances in Canada. We are now available to answer any questions. Thank you for your attention.

CMD 14-M71.1

**Oral presentation by the
Canadian Radiation Protection Association**

THE PRESIDENT: Thank you.

But before opening the floor for questions, I understand that the Canadian Radiation Protection Association is here and willing to make a presentation as outlined in CMD 14-M71.1.

I understand, Mr. Dovyak, you will make the presentation. The floor is yours.

MR. DOVYAK: Good afternoon, Dr.

Binder and CNSC Commissioners. There are actually two of us here today. I am the President of the CRPA and I brought my Director of Internal Affairs with me, and Ali can just introduce himself.

MR. SHOUSHARIAN: Hi. My name is Ali Shoushtarian. I am the Director of Internal Affairs and I am going to be doing a presentation with -- sharing a presentation with Jeff. So he will go first and I will go second.

MR. DOVYAK: Again, good afternoon. It was with great interest that we reviewed the CNSC staff report, safety performance report for 2013.

With regard to the CRPA, the report talks about us on page 24 -- sort of talks about us. It states that many of the participants are from medical, academic and research sectors. A lot of the RSOs or radiation safety officers in academic, medical and research sectors are CRPA members and their responsibilities include monitoring occupational dosimetry, ensuring that safe work practices are being followed, ensuring that the radiation protection program that was submitted to CNSC is actually being

carried out, conducting internal investigations, internal inspections and submitting event reports. You just heard from staff about some of them.

The CRPA was formed in 1979 by Canadian radiation protection professionals that were interested in establishing or representing a Canadian viewpoint. In late 1979, CRPA became an associate society of the International Radiation Protection Association, or IRPA.

Back in 1979, efforts were made to ensure that membership was diverse, came from all across Canada and represented a lot of the different professions that are involved with radiation protection and a lot of the different activities. So we had people from academic, medical, government, industry, nuclear facilities, research sectors.

Organizationally, we have been federally incorporated since 1982 and this past spring, to comply with the not-for-profit Corporations Act we changed our bylaws and Industry Canada accepted our new Articles of Continuance. So now, we legally exist under the new Act as opposed to the old Canada Corporations Act.

Today, CRPA is still a member society. We have over 300 members representing 10 provinces, a variety of radiological protection roles. We actually have some members in other countries. We have members in Austria, China, Saudi Arabia and the United States.

In 2005, we embarked on a registered radiation safety professional program with an initial examination followed by a maintenance and registration process. There are currently 43 of us at CRPA that are registered radiation safety professionals and our designation is CRPA(R). Of our eight-member board of directors, seven of us are registered radiation safety professionals.

I will turn things over to Ali.

MR. SHOUSHARIAN: Ali Shoushtarian
for the record.

Our membership is diverse and while we do represent a number of RSOs, our membership also includes consultants, lab scientists, provincial x-ray regulators, researchers, to name a few.

There are approximately 15 CNSC staff members who are CRPA members, mainly from the Directorate of Nuclear Substance Regulation.

At least 31 CRPA members are CNSC-certified Class II RSOs. When we polled our CRPA membership last September 2014, we learned that at least 42 CRPA members are RSOs for at least 20 different NSRD use-types and they represent at least 100 different licences. To name a few are portable gauges, laboratory studies, fixed gauges, diagnostic nuclear medicine; therapeutic nuclear medicine; human research studies; calibration; storage.

Recently, the CNSC and CRPA have formed a Working Group to work together to collaborate on identifying and implementing solutions within the radiation protection community in order to promote a strong radiation safety culture, while respecting and understanding the interest and expectation of stakeholders.

Often, almost one-third of our annual conference is devoted to regulatory issues. The support of CNSC and participation of CNSC staff is invaluable. CRPA members have facilitated CNSC staff in hosting CNSC outreach sessions across Canada. Those staff outreach sessions are very useful to many in the radiation protection community, CRPA member or

not.

I will turn it to Jeff for the concluding sentence.

MR. DOVYAK: Thanks, Ali.

So the CRPA has been around for 35 years quietly representing the interests of Canadian Radiation Protection professionals. Maybe we have been too quiet. A great number of the members we represent, particularly RSOs, are from academic, medical and research sectors. Through interaction with CNSC staff at conferences and other venues, a number of individual collaborative relationships have been formed and now that collaboration has been formalized by the recent formation of the CNSC-CRPA Working Group and we are looking forward to a closer relationship with the CNSC.

So on behalf of the CRPA Board of Directors and our members that are at work today, we wish to thank the Commission for this opportunity to appear before you and we will try to answer any questions you might have.

THE PRESIDENT: Thank you.

So let's jump right into the question

period and let me start with Ms Velshi.

MEMBER VELSHI: Thank you, Mr. President.

Compliments to the staff on a very good report and to industry on a very good year.

As I listened to your concluding remarks and as I read the report, it presented a fairly glowing report that there has been a lot of improvement and increased compliance and so forth. So what do you see as the top two or three priorities that we as Commission members need to be concerned about in this sector, looking forward?

MS MURTHY: Kavita Murthy for the record. I will start the question and then I will pass it on to my colleagues to add any details if they want to add.

Recent events that have happened in the industry have raised the profile of certain sectors and certain activities that we need to actively take an interest in, in the next year.

One example is the incident related to the loss of control of radioactive sources. For us as the group that has the responsibility for regulating

the control of nuclear substances, that is definitely going to be a high priority. Even internationally, there is a lot of attention these days on controlling disused sources, so we know that there is global interest in that.

In specific sectors there are industries, subsectors such as portable gauge subsector and nuclear gauge subsector where we have already started a focused effort to bring better compliance into these sectors because we know that there are problems in these sectors.

Industrial radiography is another sector where because of the volume of work related to pipeline and oil and gas industry there is going to be a lot of work. So a lot of attention has to be paid so that people working in these industries do so safely and within the regulations.

I will now pass the microphone over to Mr. Peter Fundarek and Henry Rabski to add any details if they want.

MR. FUNDAREK: Peter Fundarek,
Director of Nuclear Substances and Radiation Devices
Licensing Division.

I concur with the comments that Ms Murthy has made with respect to the focus of the ongoing efforts.

I also would like to add that one of the things we have to be consistent and careful about is ensuring that licensees have robust programs in place and follow those programs and implement them correctly to make sure that the safety is not only just on paper but it is actually implemented and effective.

The other thing that we are going to be working on is we have a number of initiatives underway -- we reported those to the Commission in August of this year -- for financial guarantees, for fixed gauges safety, and for the implementation of the security condition, and so we will be proceeding with the implementation of those programs over the next six months to ensure that they are properly implemented and effective going forward.

I will turn the microphone over to my colleague, Mr. Rabski.

MR. RABSKI: Henry Rabski, for the record, Director of Operations Inspection Division.

For us, it is very important as inspectors, the group that does the analysis out in the field with respect to compliance, to enforce the importance of safety and security and a strong safety culture in the industry.

We started an initiative this year focusing with the radiography industry as part of our annual meeting, talking about safety culture, bringing experts there. The National Energy Board has in fact participated for the first time in our annual meeting to talk about the importance of safety culture and ensuring that their work which is involved in the infrastructure in Canada, particularly on the industrial side, that they take into account the safety importance, safety significance of the work that they do, particularly on the infrastructure, the pipeline, the roads that are being built and the buildings as well. So we really focused on that as well as on the medical side.

We look for areas where we feel that emphasis needs to be placed on the workers ensuring a good safety culture in the workplace and strong practices and we are getting our inspectors out to do

as much performance-based inspections and interaction with the workers to really hit home the importance of the work that they do and how to work safely with substances.

MEMBER VELSHI: Thank you.

THE PRESIDENT: I'm sure that the Director of Transportation Licensing has something to say also.

--- Laughter / Rires

MR. FAILLE: Thank you. Sylvain Faille for the record.

Yes. On the field of packaging and transport, the upcoming one will be the implementation of probably the new regulations in the next year or so, which we are currently working on. So there is going to be some activity that will be needed to make sure that people understand the new regulations and the new regime that we are going to be moving forward and making sure that the expectations are clear for them as well regarding the new regulations that are upcoming.

MEMBER VELSHI: So shifting gears, one of the new things that you have reported in this

report are categorization of events and I notice all that have been reported have been categorized as lower risk and I know in your presentation you said that each event is initially categorized by potential risk and then once all the investigation and all the reviews have been done then you do a recategorization. I'm not quite sure I understood that correctly.

But in the event that I did get you correctly, I would be interested to know what the initial categorization was, because what we see for the nuclear power plants is what the potential risk was, not what you finally ended up as to what the impact was on health and safety in the environment.

MS MURTHY: Kavita Murthy for the record. Is there a particular event you are referring to?

MEMBER VELSHI: No, just generally, both the process and the delta between the initial and the final categorization.

MS MURTHY: I will give you an example. An event such as a barrier breach, which is a very common event that happens in industrial radiography, is most of the time someone walking into

an area and we don't know in that situation whether the source was out and they had the potential to get a high dose or if they were just in a state of readiness to do it and nothing was -- no source was exposed.

So in those situations when an event first comes in, because there is a potential for a person to receive a high dose, we would normally start off by classifying that event as potentially a high-risk event.

Given that after we get the 21-day report, after we get an analysis of the report, if it turns out that that was really a non-event because they were setting up and someone accidentally walked in and they reported it to us, we then say the actual risk of that particular event was low. So that is how we are applying the event categorization, broadly speaking, in dealing with events that we deal with.

MEMBER VELSHI: And I guess in assessing the risk, what would be helpful is that was it not just for luck this could have been a high risk, so not that there were barriers that you want to wear off in the initial -- when the event was initially reported, but it really actually is an indication of

where we didn't have good controls in place.

I can't think of an event that you have had here, but there were some that said, oh, this could have been really bad and it just turned out that it wasn't. So someone could have gone by and fortunately it was just a low source that was being used at that time, but it could just as easily have been, you know, 10 times higher.

The reason I'm getting at is that you would treat that a lot differently than, you know, how it actually ended up. So the initial categorization, there is a lot of value in that and how do we make sure we don't lose the intelligence that goes with that?

MS MURTHY: Kavita Murthy for the record.

That is a very good comment. We will definitely look at our events and try to capture -- in dealing with events try to keep the initial categorization.

But I do want to point out that a barrier event is not always -- will never always be a low-risk event. If it happens that that was an event

where a source was out, we will categorize that as a high-risk event. So it is a two-step process, that's how we have developed it, but there is nothing to say that we can't have a second look at it and capture that information.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Can I jump on this? I think in listening to this high risk, you know, I just want to make sure we are not confusing -- when we listen to NPP high risk and we listen to your categorization of high risk, it's not the same high risk and I think maybe that's where we spend all day on emergency planning for catastrophic things. It's not comparable, right, so are we using maybe or should we use different vocabulary here?

MS MURTHY: Kavita Murthy for the record.

Again, that's a great comment. We will take -- the risk categorization exercise hasn't been closed off. We are still open to suggestions and comments, so we will definitely take that into account when we finalize it.

THE PRESIDENT: I hear somebody who

wants to help you here.

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

I would like to complement the answers of Ms Murthy. You are correct, Mr. President, the evaluation with respect to risk of the events is different from NPP to the nuclear substance or other regulatory activity.

The key point here is to assess the potential of the event and when the staff or our colleagues are talking about potential event there is an evaluation to determine is this event going to impact the whole industry.

For example, when the assessment is done and if it is an equipment malfunction, then staff will issue a notice to all of the users indicating there are issues with the design or the certification process or they will go back and either alert the licensees on what they need to do.

So my point here is, yes, the risk categorization is the same wording, but, however, we need to qualify the categorization as it applies to nuclear substances. It is very obvious that in the

nuclear substances the majority of the barriers are administrative barriers in addition to the physical barriers, whereas the NPP is a completely different risk categorization and the support of the risk assessment is different and that is what we are seeing here.

All we will do is we will qualify as part of the report itself what it means from a risk and the significance of the risk in the report so the public will understand what it means.

MEMBER VELSHI: Thank you.

Because I think we shouldn't have -- and I know you folks don't, but if one reads this and says, yes, there were, you know, 50 events and they were all low risk, let's not be complacent about that because they could have just as easily been pretty serious ones.

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

Just to complement, what you are saying is very true. So we are not saying we are downgrading all the time.

--- Laughter / Rires

THE PRESIDENT: Monsieur Tolgyesi...?

MEMBRE TOLGYESI : Merci. Merci,
Monsieur le Président.

When I was looking at the industry sector report events there was a -- it's at page 39 -- breach of security. What does it mean really, breach of security? What's that?

--- Pause

MS MURTHY: Kavita Murthy for the record.

So breach of security is a misnomer. We actually -- when we explain this in the report, it is referring to a barrier breach, again the same example that I just gave. When industrial radiography work is being conducted, there is a barrier requirement for the operator to establish a safe zone and make sure that they have either posting or people to make sure nobody walks into the zone when the industrial radiography work is being carried out.

So just the connotation of the word "breach of security" gives the impression that there was an access to the source. It is not the case. In this case it was someone who crossed that barrier and

went into an area that they shouldn't have gone into.

MEMBER TOLGYESI: It's kind of an increase from 0 five years ago to 60, which is kind of a big increase.

MS MURTHY: I will ask Mr. Henry Rabski to provide a comment on that.

MR. RABSKI: Henry Rabski for the record.

Barriers in the majority of these cases were in the industrial radiography sector. They are very significant because at that particular time a source may be in the exposed position and radiation doses can be very significant for very short periods of time.

The regulatory requirements provide for two barriers. One is a signage at 25 microsieverts per hour, and at 100 microsieverts per hour, closer to where the activity would be, a physical barrier. That can be either a rope, taping or individual stationed as a barrier as an acknowledgement of what is happening beyond that point.

The increase in reporting is a work

of -- is part of the effect of our conversation or our discussion and inspections with radiography companies and stressing the significance to report these events, however significant they are. In the case here we had 14 reported in 2013 of those events that were related to industrial radiography and the significance was all assessed.

So we are encouraging companies to report those events. Whether they might be just somebody passing just around that sign at 25 microsieverts, by reporting those we can assess those and they can also make different provisions in the field to prevent people from getting close to the source.

So it is being proactive that we see the numbers going up and that we encourage reporting of those events and corrective measures being placed. So you have seen that go up and we are encouraging people in our outreach programs to report events as near misses, close calls, so that we can get those kinds of statistics as the Commission has asked about and make sure that they are aware of safety issues at all times.

MEMBER TOLGYESI: Because, as you are saying, that is the kind of lack of following the working procedures because they are saying that it should be signed there and a physical barrier there. Now, this is what is reported. Is it all reported, do you believe?

MR. RABSKI: Henry Rabski for the record.

I would probably say, in fairness, that they are not all being reported because in the case where we are doing our field inspections we have come across situations where barriers were not put up and licensees have been cited, and in some cases that wasn't the only barrier or safety provision that wasn't in place and orders have been issued.

And in the past, if you review the orders over the last several years, some of those included where barriers were not in place and other safety measures. So yes, there are ones that are not being detected.

MEMBER TOLGYESI: Because it is kind of declaring that I'm speeding, you know. It's questionable if I will do that.

On page 19 -- I'm getting once again to number of reported events -- when you are looking at medical it's a kind of fourfold increase from 2009; industrial, it's a threefold increase; academic, it's a twofold increase; commercial is a 2.5-fold increase.

Now, also, on page 38 you are saying that the number of -- what you were just stating, that the number of recorded events in the industrial sector is due to a better understanding of reporting requirements. That's why it is increasing.

The medical sector is even worse, okay. What reasons are therefore increasing the medical sector? Because in the industrial you say because it is a better understanding and they report it, but in medical it is even more increased and there is no kind of justification or reasoning why it happens.

MS MURTHY: Kavita Murthy, for the record.

It is the same reason. We believe that there is more reporting because we have focused a lot of attention on reporting requirements and we have

done our outreach. We have made people aware of situations where they should have been reporting in the past but they were not.

So we do believe that also informally in all sectors it is outreach the staff has conducted that has resulted in more reports being submitted to the CNSC.

THE PRESIDENT: Okay.

Monsieur Harvey...?

MEMBER HARVEY: Merci, Monsieur le Président.

I've got a few questions for the association, the first one being you mention in your presentation that you currently have 43 registered radiation safety professionals. So what is the benefit to be a CRPA (R) and what is the nature of the examination that conducted that?

MR. DOVYAK: It's Jeff Dovyak.

I'll answer that sort of in reverse fashion. The nature of the exam is a multiple choice exam based on 12 or 13 different areas in radiation protection that a group of CRPA members almost 15 years ago decided that those elements an entry level

radiation safety professional should know. So we have this syllabus. It changes from time to time. It's updated.

The benefit to one of our members taking the exam, passing it, maintaining their registration is -- they can tell their employer -- it's a way of demonstrating to their employer that they are taking their profession seriously to the extent that they've really studied for, written this exam, they're maintaining their registration. To maintain their registration essentially it's a verification of continuing education.

So currently the RSOs that have the CRPA credential -- that's not a CNSC requirement. Sometimes some CNSC inspectors will comment in the report that the facility they just inspected, the RSO or the Radiation Safety Coordinator has that credential. Frequently that's silent. It's not remarked on. So it's really a personal thing. There is a number of employers that support their staff that want to get this registration. Some employers don't even ask and some employers have said, "Well, it's not required by CNSC so it doesn't really make a

difference to our organization". So it's quite varied.

But I think right now what it comes down to is the 43 of us that have the credential we're taking our careers that seriously that we want that credential to prove that we're taking it seriously.

Ali might have another opinion, though.

MR. SHOUSHARIAN: No, it's actually -- Ali Shoushtarian, for the record.

It helps. I'm one of those 43 that I actually took the examination. It helps to develop your career in terms of advancement and then some -- as Jeff said, some institutions require you to have that certification. It shows that you're committed and you know what the radiation is all about or regulation is all about.

And so when someone asks you a question you could answer them in a knowledgeable, very professional way of doing it.

MEMBER HARVEY: The association -- coming from CNSC staff how many of them have -- pass the examination of the CRPA?

MR. DOVYAK: Currently none.

Previously, one did.

MEMBER HARVEY: Last question for you --

THE PRESIDENT: Can I follow-up on this?

CNSC, did you look at the value-added in terms of performance when you go to facilities or managed or activities managed by people this additional, I don't know, education, knowledge, expertise, can we call it better performance or we don't even have data. And have you considered to encourage people to do this, you know, just like we encourage keeping up to date with the new scientific developments, new approaches, new technologies?

MS MURTHY: Kavita Murthy, for the record.

To date we have not systematically kept track of Radiation Safety Officer credentials in terms of whether they are CRPA-accredited RSOs or not. We certainly can do that at inspections.

I just want to mention, to add to what Mr. Dovyak said, that Jeff Sandeman who is sitting

next to me used to be on the Board of Directors of the CRPA for several years.

THE PRESIDENT: Monsieur Harvey...?

MEMBER HARVEY: My last question for you.

What is your point of view or opinion on the report?

MR. DOVYAK: It's Jeff Dovyak. Could you restate that question, please?

MEMBER HARVEY: Yeah, I just wonder if you have some comments to do on the report presented to the Commission.

MR. DOVYAK: Generally, we are not -- we don't object to anything in the report. I think the report is laid out well. There is certainly some learning that RSOs can do from it because as you know the CNSC doesn't really publish event reports. So unless an event report proceeds onto an order or an AMP, the RP community really isn't aware that something has transpired.

So in terms of the loss of control for sources in Ontario or found sources in Alberta, I know certainly from me and my employer it was interesting

to learn that those had taken place so we could go back and look at our licensed facilities could either of those two things happen where I work.

I would expect Ali and his group probably did something similar at his hospital but generally RSOs don't know about an event unless they are involved in it. So it's not until we read a report like this that we sort of see what broadly has transpired.

MEMBER HARVEY: Thank you.

May I continue or next round? Okay, that's fine.

THE PRESIDENT: Ms Velshi, back to you.

--- Laughter / Rires

MEMBER VELSHI: So, this is not my two questions. It's really a follow-up to Mr. Harvey's question on the radiation protection community not being aware of events. And I'd like to hear staff's comments on how do you disseminate that information.

MS MURTHY: When events such as major losses of control happen we do produce focused newsletters, the DNSR industry -- the DNSR newsletter

has been published regularly for the last two years. We have four editions that come out. When there are specific events that we want to focus on then we will produce a special edition of the report. When the events of loss of control of sources happen the next edition of the DNSR newsletter has an article on that very topic.

We do presentations at outreach meetings on these sorts of events and the lessons learned from those events.

We also disseminate via email information to licensees when there is an event that is being presented to the Commission or now because we have access to the archived webcasts we will say -- we will let them know that the webcast is available and they should go and look.

It is true we don't have an event database just like some other regulators have. Their events are put on the public website when they happen. The only events that do get into the public domain through our website are the orders, the AMPs and other enforcement actions that we take.

MEMBER VELSHI: Maybe something you

want to look at for down the road, though.

MS MURTHY: Yes, definitely. Thank you.

MEMBER VELSHI: So my two questions and they're really around TRIUMF and Canadian Light Source.

So is this -- this is the first year that you are presenting the performance areas by the safety and control areas, correct? Is that why we are not seeing historical ratings then?

MS MURTHY: Kavita Murthy, for the record.

They were part of previous reports but they were not presented in the presentation the way we did this year. We decided this year that we needed to put them as a major part of the industry report presentation. But if you look at last year's industry report they were included in the appendix. And all of the safety and control areas were in it.

MEMBER VELSHI: So I can't remember that but has the performance improved or remained the same for the two organizations in the 13 areas?

MS MURTHY: I'll ask Jeff Sandeman to

comment on TRIUMF and then Ms Jacinthe Plante who is the Project Officer for Canadian Light Source to comment on the performance of the CLS.

MR. SANDEMAN: Jeff Sandeman, for the record.

At TRIUMF when you are inspecting different safety and control areas every year you tend to have a different focus. What you normally might see is you find a deficiency in one area while the next year it's been fixed and it's improved.

Having said that, I think the biggest indicator of TRIUMF is that their ALARA program is working very well and their doses are going down steadily across the site. So I would say that overall at TRIUMF, despite the occasional hiccup which is just in the safety and control area, it has improved over the last three, four years since I've been handling it.

MEMBER VELSHI: So if I were to look at TRIUMF's report of last year, this year it's got one below expectations in the fitness for service, I think, was for TRIUMF, right, because of the two events.

What would last year's have looked like?

MR. SANDEMAN: Jeff Sandeman.

I'm doing this from memory but, as I recall, last year everything was satisfactory but then again we hadn't -- you know, they hadn't had any incidents of this nature. Again, you can't look at in detail at all safety and control areas every year. You focus on two or three and the next year you cycle it at the same time you're monitoring at a lower level all the other safety control areas.

But I wouldn't say that you know, having -- going from satisfactory in one year in one safety control area to below expectations necessarily should be interpreted as things are getting worse. It's more a function of how you inspect them, what you see year to year.

MEMBER VELSHI: So we'll go to CLS. And I guess -- again, I'm trying to -- given what we hear on the nuclear power plants where there is tonnes of data points that are used to come up with the rating, here I wasn't quite sure. I think you have just again confirmed.

So if your inspection is focused on a couple of areas as the CLS seems to have been then, really, those are the only areas that you probably have a robust rating and the others are by default satisfactory. Is that correct?

MR. SANDEMAN: Jeff Sandeman.

I mean, regardless of whether it's CLS or TRIUMF you have a certain depth of knowledge for the safety and control areas you focus on. At the same time that doesn't mean you don't have other things such as reviewing their annual compliance report, reviewing mandatory reports.

You have less evidence and, yes, it is probably more likely it will be satisfactory in the other areas. But I would point out, for instance, that at TRIUMF the reason for the below expectations was based on incident reports. It was not based on the inspection.

MEMBER VELSHI: And CLS, any comments on last year's report?

MS PLANTE: Jacinthe Plante, for the record.

I think that Jeff covered most of our

same information. So we have information through different items from the annual compliance report of the events but the two below expectations for the Canadian Light Source are mainly from the inspection.

MS MURTHY: Okay.

THE PRESIDENT: Again, that's why I think Ms Velshi was focusing on historical trends. So if there were two years of below expectations I would consider this to be serious, okay?

Below expectations -- and again I just want to make sure that we use the same vocabulary that we use everywhere when we do the safety and control area that below expectations we focus and will understand why it -- and if it's two years in a row it definitely requires some attention.

And we would like to hear about mitigation and time and when and a focused inspection on follow-up on this. Did I get this approach right?

MS MURTHY: Yes, a below expectation rating will definitely result in actions that are followed and closed out systematically regardless of whether it is TRIUMF, CLS or any other licensed facility or activity that we are responsible for.

Below expectation is different from an unacceptable. An unacceptable results in enforcement actions. We will issue orders. We will issue letters under 12(2). Below expectations means that program has room for improvement that if attention is not paid that it could degrade into an unacceptable level.

So yes, we do make sure that corrective actions are identified, tracked and closed off systematically.

THE PRESIDENT: Okay.

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

If you may allow me, sir, it's a couple of things. You're asking what is the regulatory focus going to be from the previous year to the next year. And unfortunately with this report that's one of the comments provided, but it was too late to amend the report without issuing a supplementary CMD. From now on is when there are below expectation is where is the regulatory focus going to be and how the mitigation measures are going to be done, through inspection or through programmatic review.

One thing I would like -- I do not want the Commission to not recognize the fact that, under each and every CSA -- I don't think that came out clear from staff -- that they have the criteria associated with licence conditions or the regulations by which they assess the compliance of the licensee. So the compliance verification is clearly stated in the LCH and it really identifies the licensee being in compliance or non-compliant as a programmatic approval or as an inspection.

In addition to the physical inspection there is a desktop review that determines how the licensee is performing and to include the incident reporting and devolution of the incident.

MEMBER VELSHI: Thank you. And, again, sticking with TRIUMF and CLS, in the report I read that the dose information for those two facilities is not from their annual compliance report but has to be obtained from the National Dose Registry because it's not in a compatible format or for some such reason.

Tell me why and why can that not be changed so they are like other licensees and that's

where your primary source of information is.

MS MURTHY: Kavita Murthy, for the record.

In fact, the dose information that is presented in this report is from compliance reports that licensees have submitted. The dose information that we got from the National Dose Registry was not in a form that we could use in this report which is why we went back to the annual compliance reports and reported those from there.

I would just point out that the dose information that is presented in our presentation is the one that you should be looking at, not the one in the report.

MEMBER VELSHI: So as I look at page 6 of the report the last sentence there -- okay, I'm sorry. It's on number -- it's not on dose then. When I read that last sentence I took that to mean that the dose information for those two facilities was coming from the National Dose Registry.

MS MURTHY: Yes. Kavita Murthy, for the record.

You are quite right. Initially when

we did the analysis we did take information from the National Dose Registry but we found that the information that the National Dose Registry had provided to us was in a format that was very different from the format that we had used last year or the year before. So we had to -- we had to go back to annual compliance reports because of that reason. We found that the information they provided was split in four quarters and there was no way we could correlate the doses to individuals in four quarters and make any sense out of it.

So going forward, unless National Dose Registry can provide to us information the way they have done in the past, we will not be able to use that information unfortunately.

MEMBER VELSHI: But look at page 10, at the bottom of page 10 on data collection.

I don't know whether we are both saying the same thing but that last sentence on page 10 is saying that the dose data for TRIUMF and Canadian Light Source had to be obtained from the National Dose Registry because their annual compliance report format was incompatible. So what you're saying

is that's not correct anymore.

MS MURTHY: Yes. And that is -- you are quite right in what you are reading and understanding. The reason we had to make that change was because this error that we discovered in the high energy accelerator sector and that was stemming from the data that the National Dose Registry provided.

So we will make that correction in the report when we finalize it. But the information that is on the slides that we showed that is the correct information. We are confident in that and that information is provided from the annual compliance reports.

MEMBER VELSHI: Thank you.

THE PRESIDENT: Mr. Tolgyesi...?

MEMBER TOLGYESI: Merci, Monsieur le Président.

On page 10 when you're talking about enforcement actions you are saying that there were two administrative monetary penalties in 2013.

MS MURTHY: Kavita Murthy, for the record.

Yes, two administrative --

MEMBER TOLGYESI: Yeah. How many are in 2014, year to date?

MS MURTHY: To date, we have issued six administrative monetary penalties in 2014.

MEMBER TOLGYESI: You know, we were talking about publishing those who are not -- or they have monetary penalties or other ones to publish it on the CNSC website because we observed in other sectors that publishing is a kind of disciplinary measure. Do you think that monetary -- administrative monetary penalties are seen by the licensee as a disciplinary measure to comply with regulations?

MS MURTHY: I apologize. Kavita Murthy, for the record.

A method -- a way for discouraging or --

MEMBER TOLGYESI: Yes, that --

MS MURTHY: -- encouraging compliance?

MEMBER TOLGYESI: Yeah. That an administrative monetary penalties encourage to comply with the regulations. That means they have this as an impact on licensee to not -- for non-compliance.

MS MURTHY: As you are aware -- Kavita

Murthy, for the record -- administrative monetary penalties is a new tool in the compliance toolbox that the CNSC got last year. We are definitely getting the sense that especially in industries where there is -- profits drives the business that imposing an administrative monetary penalty has -- gets the attention of industry.

I know that my colleague, Henry Rabski, has a lot of experience speaking with industry stakeholders so I'll have him comment on this.

MR. RABSKI: Henry Rabski, for the record.

I think it is quite evident by the comments from the CRPA representatives today is that they are very aware of this new tool. And they monitor it closely, because it's an indication of what action the CNSC is taking, and when we feel there is significant action an administrative monetary penalty needs to be issued.

I have spoken to a lot of industry people in our outreach or just in day to day transactions, and they monitor the issuance of administrative monetary penalties very closely, and

they are sharing that information internally in their organizations as lessons learned. And they are also doing it as looking internal to see do we have that problem, does that exist in our organization?

So it is something that is being watched closely by all the licensees. And they are taking time and they are asking questions of our staff with respect to that. So they are monitoring that and taking them seriously, and they are integrating changes in their programs probably to be proactive and also to look at the lessons and apply good practices where they need to be fixed or even just verify that they are on the right track. And that particular penalty would never be issued to their organization because of the measures that they have in place.

So it is a good measuring tool across the industry and they are using it internally as a lessons learned mechanism.

MS MURTHY: I will invite Mr. Peter Fundarek to add to this please.

MR. FUNDAREK: Peter Fundarek, for the record.

Yes, I would like to confirm what Mr.

Rabski was mentioning earlier with respect to the information we are getting from outreach.

We have consistently heard from licensees attending all of our outreach efforts across the country that AMPs figure prominently in their decision making right now in terms of making sure that they address issues promptly and that they understand what the expectations of CNSC are in order to ensure that they are not subject to AMPs.

It is a very visible, very public campaign. And so the licensees are very very aware of it. And I do believe that it is helping to promote compliance.

MS MURTHY: Kavita Murthy, for the record.

I will add that there was an AMP issued to a hospital as a result of the event with the loss of control of sources.

And knowing that Mr. Dovyak works for a major hospital, perhaps this would be a good time to ask him his opinion about what was happening there.

MR. DOVYAK: Jeff Dovyak.

Yes, I work for a health authority in

a prairie province.

We were somewhat aware of that event by the RSO grapevine. But when the AMP was issued I sent that to a lot of stakeholders in my health authority saying, this is what happened in a city in Ontario, and here is the mechanisms we have in my health authority I think to prevent it from happening.

But just read over what happened and maybe now you will see why I put those mechanisms in place a few years ago.

So, yes, it certainly made the RSOs that I speak to regularly in healthcare take notice that, oh, it is not just someone in the industrial sector getting an AMP, now it is a medical sector, and it could it happen in my hospital or Ali's hospital?

So, yes, it was certainly something we all took notice of.

MEMBER TOLGYESI: These monetary penalties, when you do them you address them to the employer, am I right?

MS MURTHY: Kavita Murthy, for the record.

Not necessarily. An administrative

monetary penalty can be levied to an institution or to an individual.

MEMBER TOLGYESI: Did it happen that it was going to an individual? Yes?

MS MURTHY: Yes, it has.

MEMBER TOLGYESI: My second question is on page 21 of your report. When you are talking about reported events relating to radiation doses to other workers, which means non-nuclear energy workers.

It is the last paragraph, last three lines. There are four reported events involving other workers; two in diagnostic and therapeutic nuclear medicine, and one in industrial radiography. One is missing there. One should be plus one in radiation therapy.

MS MURTHY: Yes, you are quite right.

MEMBER TOLGYESI: And on page 20 when you are going to other page, you changed the number of, in 2009, number of reported events to 39, which means that the total will increase also to 102.

THE PRESIDENT: Thank you.

Monsieur Harvey?

MEMBER HARVEY: A quick one. In the

report there is packaging and transport, 26 reported events over approximately 1 million packages. So it is not very important compared to the traffic.

Is that a credible figure in that sense? Are we missing something? Is it possible that it should be more than that, but there is only 26 reported?

MS MURTHY: Kavita Murthy, for the record.

Those are the ones that are reported to us.

MEMBER HARVEY: Yes, I know. But I mean, like could there be more events than that but they are not reported to the Commission?

MS MURTHY: Kavita Murthy, for the record.

I will ask Mr. Sylvain Faile to respond to this perhaps with some information about missed events.

MR. FAILLE: Sylvain Faile, for the record.

I would say in general we are receiving the -- those are specific to the nuclear

substances regulations, it excludes other events that are reported through other facilities that are also regulated by the CNSC.

But the numbers are always low and it is comparable to other countries as well. And I might say that most of those events are very small in nature, and we do get reports for accidents where a vehicle is involved in an accident on the street where there's no damage to a package. So we know even those are reported. So if there was something more, we would receive those as well.

MEMBER HARVEY: So it is almost the same in other countries?

MR. FAILLE: It is very similar based on some information that I received from other countries. The numbers are always low for those kinds of material and I think it has to do with the fact of the nature of the material being transported, and the training that goes into the people that are transporting and handling those packages.

MEMBER HARVEY: Okay. Last question. Taking into account the potential impacts of these sectors, compared to a nuclear reactor and fuel

facilities and mines, how will you clarify the efforts even by the CNSC on that sector with the others? Is it reasonable, comparable...?

Not easy to answer?

MS MURTHY: I will ask --

MEMBER HARVEY: Do we devote enough efforts to the sector or much more than...?

MS MURTHY: It is true that in comparison with the public exposure that nuclear facilities get that these are much more accepted by the population as radiation activities.

The level of effort is commensurate with the risks. So we have one directorate looking after this number of licences and doing it quite effectively. So I do believe we are expending the right amount of effort.

I think that Mr. Jammal has some comments that he would like to add.

MR. JAMMAL: Ramzi Jammal, for the record.

Mr. Harvey, you asked the question is how much effort are we putting I guess nuclear facility versus a nuclear substance or even transport

in general?

I would like to provide you an answer at the high level with what we have is performance indicators by which the operations at the CNSC will look at the effort that is being expended against a nuclear facility and a nuclear substance.

So there are two numbers we will look at. We will look at the person days with respect to inspections. So, for example, you take a nuclear power plant. An inspection of a nuclear power plant, if you go by number of inspections, probably 10-15 a year. But if you look at the person days spent per inspection, is you are looking at quite a significant number of person days.

The reverse applies in a high volume, low... I mean, I am not lowering the risk here, but the risk is completely different in the nuclear substance environment.

So if you go by the number of inspections, you are talking thousands of inspections. Which is the total number corresponds to the total number of efforts we have got based on risk-informed both decision making and risk-based regulatory

oversight. So these are balanced.

So that is why we cannot be at every corner, not at every licensee. I am pretty sure Mr. Dovyak, Jeff, will hate us to be at his hospital everyday.

So what we do is we evaluate and we look at the risk associated with the activity. And we establish and place a regulatory activity plan that puts our resources from DNSR or any other facility with respect to, for example, high risk in the DNSR world, industrial radiography is considerable high-risk.

So Mr. Rabski's group will put the effort against that industry in order to maintain one visit every three years unless there are other indicators that we have to increase regulatory focus.

So it is variable, but the key point here is, yes, we have enough effort and resources in order to ensure that safety is maintained at all costs.

THE PRESIDENT: So this is a good time for me to piggyback on a particular question. And in a couple of places here you mention a reduction in the

number of licenses because of consolidation.

And what surprised me also was, you know, at one time we were looking for an explosion in the health sector of more and more kind of facilities. But I think the trend is reversing, it is going down.

Will that impact resources?

MS MURTHY: Kavita Murthy, for the record.

The number of licenses and the number of activities that are included in a licence are two different things.

So we are consolidating different use types, different types of activities under one licence, mainly to reduce the red tape on licensees and allow them to maintain one licence, submit one annual compliance report and then generally to be able to better maintain their program under the umbrella of one licence.

That does not mean that the complexity of the activities or the number of facilities, the number of individual licensed activities that are taking place is reducing.

So to think that because there is a

reduction in the number of licences, the amount of work is going down is very incorrect. It is in fact the amount of work is increasing for us because we are seeing a fair amount of expansion in many of these facilities where they have an existing license in an existing hospital, and they are adding on things to that licence because now we have enabled it.

We have allowed them to do that and we have put systems in place that allow us to integrate all of that under one licence.

THE PRESIDENT: Okay. Thank you.

Ms Velshi?

MEMBER VELSHI: Is it a challenge to have the regulatory requirements stay in pace with technology development, particularly in the health sector? I mean, you know, the visit I made to a health facility, they are doing some really cutting edge innovative stuff.

And I just wondered if it poses a challenge as a regulator when new technology is being introduced at such a rapid rate with the different ways of doing things?

MS MURTHY: Kavita Murthy, for the

record.

One of the good things about the way our regulations are is that they are written in fairly general language. So a lot of times when there are new technologies coming in we do have the ability to adapt the regulations.

We do translate the regulations into regulatory expectations in clear plain language and produce detailed licence application guides and sharing information with licensees on how a particular requirement for a particular type of activity is going to be regulated.

So, for instance, if you have a facility that has a certain type of safety system, then we will say that the regulatory requirement related to safety systems for this type of facility is going to be applied in this particular way.

And that is done because we have put in a lot of effort into producing licensing guides and translating regulatory requirements into real and clear expectations. The same goes for our inspections. So we do tell them, here is the regulation and here is how we will inspect you against

it.

We do have some challenges because there are new types of activities that did not exist five years ago. For instance, we have mobile accelerators now operating, doing cargo screening for which we have to use the regulations we have.

But we don't necessarily want to introduce for these facilities the types of safety systems that you can only have in a fixed building.

We do have the general nuclear safety and control regulations, which applies to all types of activities which is written in very broad language. So we are able to maintain safety. Of course, the more prescriptive you make the regulation the harder it is then when something changes to add on something new.

So is there optimization required?

Yes, there are absolutely some places where we could make changes and have better control with regulations. But are we prevented from regulating effectively because of the regulations? Then the answer is no.

MEMBER VELSHI: Thank you. And one very quick question.

On page 11 under section 3.7 on inspection ratings for sealed source tracking, it is one of the changes where you said this was previously reported, but it will no longer be included.

Remind me why you have stopped doing that.

MS MURTHY: Kavita Murthy, for the record.

Compliance ratings with this particular requirement was very high. And we found that we were repeating some of the same information that was already in the public domain in the form of this very extensive report that we are publishing.

So in order to keep this report more concise, we decided not to include that.

MEMBER VELSHI: Though, I think for the sake of completeness, even if there is just a statement that there is high compliance in this area, would just make this more complete. Thank you.

MS MURTHY: Thank you. Yes, we will do that.

THE PRESIDENT: Mr. Tolgyesi?

MEMBER TOLGYESI: Go to page 43 of

your report. This is safety performance of academic and research.

We corrected the 5,716 and high energy research brought this to 2,504, eh?

Now, tell me what is that, 2,504? It is the number of nuclear energy workers?

MS MURTHY: I will ask Jeff Sandeman to respond to that question.

MR. SANDEMAN: No, that is not the number of nuclear energy workers. Like many facilities, both TRIUMF and CLS have nuclear energy workers and other workers who are -- doses are monitored.

In the presentation what you will see is there were 269 nuclear energy workers at TRIUMF and 151 at CLS. The remainder of the workers in that cohort would be other workers, that would include visiting researchers who are badged, contractors coming on site or other staff working, but whose dose is not likely to exceed 1 millisievert.

MEMBER TOLGYESI: But they are not energy workers?

MR. SANDEMAN: They are not nuclear

energy workers, no, and it is a combination of both.

MEMBER TOLGYESI: But at the bottom line, what you are saying, academic research is 9,803, which is number of energy workers.

MR. SANDEMAN: Well, first of all, the 9,803 does have to be corrected, that is a carry-over from this. I am sorry, I am going to have to get back to you on that one. I will look at the data that was presented there, because there was a mistake in the data.

MEMBER TOLGYESI: But this is the same thing for other sectors. If you go to, I don't know, to page 34, which is industrial sector, there is fixed gauges, oil-well loggings, and these numbers in brackets are nuclear energy workers or something else?

MS MURTHY: Kavita Murthy, for the record.

I am just listening to what David told me. So the number 9,491 is the total number of workers, including not NEWS.

MEMBER TOLGYESI: No.

MS MURTHY: I will let David respond to that.

MR. CELESTE: David Celeste, for the record.

The number in the brackets are NEWS, the total number for the industrial in brackets includes those highlighted in this report, but also those in that sector that are not highlighted in this report.

MEMBER TOLGYESI: What do you mean by highlighted or not? When you are looking -- I don't know which one, say -- which page are you on? Go to page 34. You said fixed gauges is 501, oil-well logging 2,249, et cetera.

And industry has total -- has 9,491 as the number of energy workers.

So expected that when you go to radiography this is 2,671 which are energy workers. They are?

UNIDENTIFIED SPEAKER: Yes.

MR. TOLGYESI: But there is something missing because there is an area where is -- I don't know, when you are looking -- I am going back to your -- see academic and research. There is 9,803 energy works. But when I add laboratory and high

energy, I am coming just to 6,200. That means I miss 3,800 energy workers somewhere.

MS MURTHY: Kavita Murthy, for the record.

Now I understand what you are getting at. And so the response is that the first -- if you are on page 34 --

MEMBER TOLGYESI: Okay.

MS MURTHY: -- there is fixed gauges, oil-well logging, portable gauge, and radiography. Those are just four of the sectors that make up industrial.

Industrial has other types of activities included in it, in which it will be operating a neutron generator, operating calibration or radiation facilities.

We have not highlighted them in this report, so if you add those in, that is the number you would get.

MEMBER TOLGYESI: Okay.

THE PRESIDENT: Okay. But you really got to be careful and somebody should go and do the edit of the math. Because when you start on page 32

describing the sector as a whole, you are not saying that you are excluding some people.

Because it says the sector -- I am looking at the sentence starting with 6.0 on page 32. This account for 1,440 licensees, and 9,490 nuclear workers. It doesn't say that there are other ones that are not included here.

So in the math, in the table, they all look like nuclear...

So you have to explain, it is either all nuclear or a mix of nuclear or... Anyhow, you have to do the math, please.

MS MURTHY: Thank you. Yes, we will. We realize it is not very clear when we read it, so we will make sure it is clear.

MEMBER TOLGYESI: And there is a typo also that page 32, you say it is 9,490 nuclear energy workers. But in figure 20 you are saying it is 9,491. I mean a typing error, that is it.

But my objective was, you know, to make sure that we will straighten the numbers.

I don't know if it will be useful that what you do because you do evolution over a period of

five, six years -- if you put also progress of number of employees, nuclear energy workers and not total number of workers because number of events depends lots on the number of employees so we will see that is there a correlation or it is not.

MS MURTHY: Kavita Murthy, for the record.

This is the first year that we have actually got data on all the information that is submitted to the CNSC, so going forward, certainly, we will be able to get a more reliable snapshot of how many people actually work in that industry and how that industry changes over time, so we will certainly do that.

And you're quite right; the number of events, the -- that we notice depends very much on how much work is being carried out in that particular industry.

So it will give us a good feel for whether there's a correlation between the number of events, the number of accidents that are reported to us and whether that is related to the amount of work that is being carried on and the numbers of people

that are involved in that work.

MEMBER TOLGYESI: I should say that, in spite of what I was saying, there are some corrections. I think it's a good report because it gives a picture of total and after per sector, so you have a picture of where they are going.

THE PRESIDENT: And in case you didn't get it, we like data. We like numbers. We just don't want to be the editors of the data.

Okay. Mr. Harvey?

Ms Velshi?

I've got a few.

First of all, a couple of just quick comments.

You know, in your graphs, your three-dimension graphs, I understand the effort. They're very pretty. But somewhere in many of the graph, it doesn't -- you know, you use the table below greater than 20, but nowhere does it say less than 50. You know what I'm saying?

I mean, many of those graphs, the less than 50 I have to fish for the statement because greater than 20 can be more than 50; right. So you've

got to qualify this somewhere, I think.

MS MURTHY: Yeah, that's a good point. We'll add another column and it'll be a column with zero so it will allow --

THE PRESIDENT: Or just put -- you know, in many of them I think you can put, you know, the notation above 20 and less than 50.

One thing that I -- on page 12, I'm always curious -- this is on top, security of nuclear substances. The first sentence:

"In May 2013, the Commission approved the REGDOC-2.12.3."

My question is -- what I don't get is mandatory compliance will start in 2015? Two years. Why?

MS MURTHY: When the -- Kavita Murthy, for the record.

When the document was presented to the Commission, it was a part of the strategy for the implementation to have this document be applicable to licensees holding Category 1 and 2 sources in May 2015, so that is -- we are following the plan that we presented when this document was put into place.

That's not to say that we don't inspect against -- for security. Security inspections have been a part of our activities for some time now.

The reason we haven't presented new information on security inspections is because this particular document, when it came out, some of the regulatory expectations had to be adjusted so that it would match the expectations in the document.

So compliance inspections against these documents are ongoing.

Licensees, by and large, are compliant with this document. So we will be making it a formal requirement by way of licence condition to be fully compliant with this document by 2015.

THE PRESIDENT: So it wasn't because we didn't find a clever way to make it mandatory immediately across the whole licences.

And the reason I'm asking this is you flip to page 40. In page 40, we see -- and you know, I'm always worried about Category 1, 2 and 3. And I always have questions when I see incomplete investigation or the file is not closed.

So in a couple of those bullets, if

you look at the -- page 40 in the second bullet:

"Three events involved fixed
gauges containing Category 3."

Now, there's no date, and I don't know
how long this has been, but the remaining two gauges
have not been recovered. Still under investigation.

There's no time, no nothing.

MS MURTHY: Kavita Murthy, for the
record.

So those -- it is true that those
gauges have been -- one of those gauges is missing,
was found -- was declared missing by the licensee and
one is -- has been declared as lost.

There are police reports that have
been filed, so there's really -- there's really
nothing in terms of -- more in terms of investigation
that we can do until they're recovered.

Now, we do know which -- the serial
numbers of these. We do know if they are found
somewhere, do -- how to correlate it to the lost
source because we have that information, but that
is -- that is essentially what is the status of those
events.

I think my colleague, Peter Fundarek, has something to add.

MR. FUNDAREK: Peter Fundarek, for the record.

Just going back to your question with respect to the implementation of Regulatory Document 2.12.3 on security, there -- in that document, there were a number of new requirements for licensees to adhere to, including criminal record checks, improved security for sources in transfer -- in mobile situations, increased requirements for security plans. And we needed to allow licensees time to implement those solutions to those new requirements.

And so this was part of the strategy -- as Ms Murthy presented earlier, this was part of the strategy given to the Commission back in May of 2013, that we require a two-year implementation date for the Category 1 and 2 sources, and then implementation for the rest of the requirements for Category 3, 4 and 5 would follow in May of 2018. And that will be reinforced through the implementation of a new licence condition that will be added to all licences.

THE PRESIDENT: It's just until our new regulation kicks in, I'm always worried about whether old regulation are weaker than the new regulation. And in Category 1 and 2, you know the kind of grief we will suffer on such events if something happens in Category 1 and 2, and 3.

MR. FUNDAREK: Peter Fundarek, for the record.

CNSC staff have been advising licensees since May 2013, and probably before that, specifically with respect to the requirements of this new regulatory guide -- Regulatory Document, pardon me, with respect to the requirements that are going to be necessary to meet and maintain compliance following that.

So licensees are already actively working to implement these types of security measures, and so we do have a high level of compliance already. Lots -- many of the licensees have submitted the security plans required, they've implemented the locks that are required, and they are implementing the personnel reviews that are being required as well.

So this is an ongoing process, and it

is being implemented by licensees as we speak.

MS MURTHY: Kavita Murthy, for the record.

I do also want to point out that compliance promotion is an integral part of compliance inspections, so when inspectors are on site inspecting a given licensee, they do take time out of the inspection to talk about upcoming documents and upcoming changes that they need to be aware of. And I have Mr. Jonathan Schmidt, who's the coordinator for the Mississauga office, who would like to add something.

MR. SCHMIDT: Jonathan Schmidt, for the record.

Yes. So the inspections that our staff do in the regional offices include verification of security. And what's been happening for years is we've been looking at security, but these requirements have not been documented officially for licensees.

In fact, licensees have been meeting physical protection requirements for years and, in the past, our Nuclear Security Division did the inspections and now, since April, I believe, 2013, the

inspectors of OID, Operations Inspection Division, have been doing these inspections.

So it's not that these requirements are necessarily new. There are some additional administrative requirements that licensees will have to fulfil such as the criminal record name check for their employees, which are not currently in place, but physical protection measures are being evaluated and any non-compliances are being corrected as necessary.

THE PRESIDENT: Okay. Thank you.

On a positive side, on page 16, just a comment on operating performances really across the whole sector has really improved quite a bit, so I don't know if it -- the message is getting out or you guys are causing this improvement in performance, so well done, as far as we're concerned.

And it will be interesting to see if this trend continues.

My last comment or question is to the Radiation Association. You mentioned that you've been maybe too silent. You know, you don't appear in front of us often on files.

Why not?

controlled after August 14th.

This is a company that supplies a large number of hospitals a very important medical isotope, so to say that they have to completely stop would have resulted in a lot of hospitals not being able to continue their nuclear medicine -- diagnostic nuclear medicine work, so we did not issue an order to this company to stop the work.

If Peter Fundarek or Henry Rabski have anything to add.

MEMBER HARVEY: Is that the first time that such event happened?

MS MURTHY: Kavita Murthy, for the record.

With this company, this is the first time we have seen. Contamination of packages is not unheard of. It happens.

The issue in this case was it was repeated. It seemed like it happened once and then they were informed, they were supposed to be taking corrective actions, and they did not. And it continued on for three days.

So for us, the repetitive nature of it

and the fact that corrective actions that they were taking were either not sufficient or not -- not at all effective were the more concerning factors in this case.

MEMBER HARVEY: Two days after, knowing -- I'm talking for the Commission here. Knowing that they had that problem, was it necessary to just stop it and -- because I don't know. I'm just -- what is our responsibility?

THE PRESIDENT: Okay. Let me try to piggyback on this.

Well, somebody must have determined how radioactive was the material. I mean, contamination can be miniscule or can be very serious because if it was very serious, I'm with Mr. André Harvey, is you shut it down and then you ask the question.

So somebody must have decided that this is not serious enough. Am I right or not?

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

It's the -- you're correct. Was there immediate health and safety risk? The answer is no.

It's -- technetium is a short-lived isotope and, as Ms Murthy described, the fact that contamination occurs every once in a while.

The key element here is the repetitive of this mismanagement, so you've got two elements. You've got the program itself and the implementation of the program by the licensee.

So before the -- we shut them down, we will -- let me reiterate the fact is, we are not afraid to shut them down. The key point here was, was it an immediate health and safety risk. The answer is no.

Then we take in consideration is it the first time that the licensee is in non-compliance, and then there is verification being done by staff.

However, we're raising it to the level of the Commission so in order to provide information in transparent manner to the Commission and the public.

But as Ms Murthy is, we're going to put the emphasis on the root cause with respect to the program itself and the corrective actions taken.

But if this company is going to repeat

such ignorance to the law, we're going to take appropriate action accordingly. But we have not finished yet the implementation of our compliance tools in order to finalize what the outcome is going to be.

But the ignorance to the law is not going to be tolerated.

MEMBER HARVEY: Before the incident, have you made any inspection or control and monitoring of that Isologic?

MR. RABSKI: Henry Rabski for the record.

This is a high-risk facility because of the actions that they undertake in the medical community supplying an important isotope. We have inspected them and there had been findings in the past and in normal cases, as in all inspections, follow-up is required and corrective actions need to be taken.

So we are aware of their track record and this one has obviously brought more attention to them outside of the facility because of the observations that we have seen inside, but now that this is reported as an incident that involved the

transportation to one of their clients or customers, this is now ramping up our concern about the performance and we take it seriously and are doing a thorough evaluation of the report that they have supplied us and the corrective measures that they have proposed.

I think it's very clear, as stated by my colleagues too, the event was reported on the 14th. Since that time we have been in touch with the customers in the area. The hospitals in the Montreal region were very diligent. They reported it immediately to the licensee so that they could take those actions and be aware of what was going on.

And we are in close contact with them to monitor whether they are also receiving any further information of contamination and at this point we haven't been notified of any further events from this particular licensee.

They are one of two that supply this type of medical isotope pretty well in the Province of Quebec and in Eastern Canada, so they are a significant player in this field and we are watching them closely and continuing with our investigation,

preparing to report back to you as soon as we complete that investigation.

MEMBER HARVEY: How come it wasn't detected at the facility itself, because they should have --

MR. RABSKI: Henry Rabski for the record.

The procedures that were in place under their licence involved a monitoring step as the truck driver or the transporter left the facility to deliver and that's part of the investigation, why that step didn't catch the contamination on six separate occasions, because he transported twice per day for three days, and on the other end we have detected and we have confirmation that there was contaminated packages transported to customers, hospitals in the Montreal area. So that is part of the investigation and we are looking for those answers.

THE PRESIDENT: Okay. Well, I'm really surprised here. Okay, so it is a major hospital and yes, we have a directive to make sure that all isotope production and medical things, we don't shut them down frivolously. However, I can't

understand why you didn't send, and do it right away the next day, an unannounced inspection that you would do in a radiographer kind of situation and have done so without hesitation.

So here we are, it's now six weeks later and you still haven't been to the facility, if I understand the report. You are just planning to do it in -- perform an unannounced inspection in the future sometime. Why?

--- Pause

MR. RABSKI: Henry Rabski for the record.

When we have an incident, we have to make a decision on what we need to do for follow-up. In this particular case, we have arranged -- we have commenced our investigation, which has involved speaking directly with the parties, all that were implicated in this event. We have spoken to the hospitals. We are planning to interview the individual. She was not the technician, was not available due to medical reasons, wasn't available for an interview. So we have scheduled that.

And we had other regulatory actions

planned in the coming months with our colleagues from Class II because they also hold other licences and we wanted to combine the site visit after we saw -- so we could measure what steps the company has taken place and what the reaction has been as a result of the events, so what measures they have put in place. We would like to get a chance to evaluate that and it takes days to get that implemented. So we are going to do that evaluation.

THE PRESIDENT: Yes, I know you are going to do it, but it's totally inconsistent with the kind of action I have seen you perform in other facilities in other events. These are three distinct hospitals with contamination. I would think that the next day I would have sent somebody over there. Go ahead, please.

MME SIMONEAU : L'incident a été rapporté deux jours plus tard à un inspecteur après l'incident, à un inspecteur à Laval, et cette personne-là était absente. Donc, elle a eu connaissance du rapport seulement quatre jours plus tard après l'incident. Donc, c'est pour ça qu'il n'y a personne qui a été informé, puis personne n'est

allé.

Puis ensuite, il a fallu l'investigation pour découvrir qu'il y avait eu des colis qui avaient été envoyés sur trois jours, parce qu'initialement, le rapport soumis par le titulaire de permis parlait d'une seule livraison de colis contaminé.

LE PRÉSIDENT : O.K. J'accepte quatre jours. Ce n'est pas six semaines.

MME SIMONEAU : Non, mais ce que je veux dire, c'est pendant les jours suivants qu'on a fait l'investigation, qu'on a découvert, un à un, que les colis avaient été livrés à d'autres hôpitaux, parce qu'eux ne l'avaient pas rapporté à Isologic, ni à leur responsable de la radio protection corporatif. Donc, il a fallu plusieurs jours pour réussir à contacter ces gens-là, à suivre le chemin du travailleur pour arriver à trouver l'information.

LE PRÉSIDENT : Monsieur Harvey...?

MEMBRE HARVEY : Je comprends mieux là que ça l'a retardé un peu, mais je suis d'accord avec le président que rendu à quelques semaines plus tard, on aurait dû faire quelque chose, parce qu'annoncer

quelque chose de non prévu, c'est déjà l'annoncer. L'inspection non prévue, elle aurait dû être faite sans être annoncée à l'avance.

LE PRÉSIDENT : C'est ça.

Monsieur Tolgyesi.

MEMBRE TOLGYESI : Merci.

Je suis d'accord qu'il y avait aussi de notre côté un petit peu d'hésitation, parce quelque chose comme ça qui arrive, ça demande une action immédiate. C'est comme si on a dit, la maison brûle, mais on va regarder avant d'appeler les pompiers. Il faut agir tout de suite.

Dites-moi, est-ce que cette compagnie Isologic fait la livraison et distribution d'autres paquets aussi que les isotopes?

MME MURTHY : Non. Je pense que l'entreprise est de livrer les isotopes médicaux, les différents isotopes médicaux.

MEMBER TOLGYESI: Okay. So there was no contamination for some other packages which were not originally radioactive.

Is there -- you are saying to some extent that there is a kind of procedure when the

truck is leaving Isologic and there is some measure of radioactivity on the packages or there is nothing, no procedure which is saying that we will spot-check once in a while the packages, I don't know, every day, two or three?

MS MURTHY: Kavita Murthy for the record.

The procedures that Isologic has requires them to monitor every single package before it is put on a truck.

MEMBER TOLGYESI: So they didn't do that. That's one way, you know, when you are leaving the storage or warehouse. Another one is probably to have the driver have some Geiger or something which could specifically measure once in a while when he is picking up a package, getting to the hospital, if there is some contamination or not.

MS MURTHY: Kavita Murthy for the record.

There are hand and foot monitors that drivers are -- people who handle isotopes when they are leaving the facility they are supposed to remove their protective gloves and monitor their hands to

make sure they are not bringing anything outside the facility into the rest of the world. So that is also a requirement.

MEMBER TOLGYESI: Okay. So the driver loads up the packages with the gloves, et cetera. After he removes the gloves, he leaves them on the site and he is going to the hospital and he is unloading these packages by bare hands?

MS MURTHY: Kavita Murthy for the record.

I believe that is correct and I also believe that Lucie Simoneau has some information she wants to add to this.

MME SIMONEAU : Selon les discussions que j'ai eues avec la responsable de la radio protection, la personne aurait contaminé ses mains en manipulant des unidoses à main nue, puis en portant ses gants par la suite.

Donc, quand ils ont fait les frottis de la valise avant de l'expédier, la valise était propre parce que la personne portait des gants. C'est lorsqu'il est sorti, la valise est propre, mais lui a enlevé ses gants, et c'est par la suite, quand il a

manipulé les colis, que là, il a contaminé les colis avec sa main droite. Puis l'hypothèse qui a été sortie, c'est qu'une des valises cette journée-là n'était pas contaminée parce qu'il l'a probablement manipulée avec sa main gauche, qui, à ce moment-là, était propre.

THE PRESIDENT: For type A, I thought type A you can handle with bare hands.

MME SIMONEAU : Lucie Simoneau.

Les Type A package qui sont utilisés pour le transport d'isotopes médicaux sont carrément une valise avec une poignée.

LE PRÉSIDENT : Oui.

MME SIMONEAU : Donc, on transporte ça à main nue avec la poignée, parce que le taux de rayonnement à la surface, ce n'est pas comme une grosse jauge ou c'est vraiment quelque chose qui se transporte comme une valise.

LE PRÉSIDENT : Oui, mais est-ce que c'est absolument nécessaire d'avoir des gants pour...

MME SIMONEAU : Non. Mais il ne devrait pas être transporté parce qu'avant de quitter l'industrie, le paquet est propre. C'est l'obligation

du titulaire, avant d'expédier un colis, de s'assurer qu'il est propre. Donc, on devrait toujours le manipuler à main nue.

LE PRÉSIDENT : Monsieur Tolgyesi...?

MEMBRE TOLGYESI : Dites-moi, vous avez dit que l'inspecteur... Il y a un inspecteur. Je ne sais pas quel inspecteur. C'est un inspecteur de sûreté nucléaire ou c'est un autre inspecteur qui est pour la commission de la santé ou je ne sais pas? C'était quel type d'inspecteur qui a été avisé mais qui était absent?

MME SIMONEAU : C'est un inspecteur de la Commission canadienne de sûreté nucléaire, du bureau régional de l'Est.

MEMBRE TOLGYESI : Ça veut dire que s'il y a quelque chose qui arrive, est-ce qu'il y a une procédure qui dit, bon, bien, l'inspecteur n'est pas là, bon bien, on empile les dossiers sur son bureau ou il y a quelqu'un, dépendamment de la gravité ou je ne sais pas, qui le distribue? Parce que the licensee was giving a report and the inspector was not there. He is leaving that there, so who knows what the seriousness of a contamination is and what actions

should be taken?

MS MURTHY: Kavita Murthy for the record.

The normal process for reporting events when an event happens is for the licensee during working hours to call their licensing officer. In this case they called the inspector. We do not know why they called the inspector and why they left the event report with the inspector.

MME SIMONEAU : Excusez. They don't even call the inspector, they just sent an email. Then the inspector received an email in her inbox and that's it. They don't contact anybody else even if it was a message saying that she was on vacation.

THE PRESIDENT: This is a regulatory issue. Did the hospital staff report the contamination to their own RSO and did the RSO have the obligation to inform us directly?

MS MURTHY: Kavita Murthy for the record.

Yes, the hospital staff reported to their site RSO and the site RSO did exactly what they were supposed to do, is to call the company. There is

no obligation under the *General Nuclear Safety and Control Regulations* that they have to tell us. Because they followed their procedures. They checked the package, there was contamination, they called the company.

THE PRESIDENT: Okay. I find this surprising actually. I thought that the RSO -- any contamination of nuclear contamination would be a requirement to inform us, and if not, should there be? --- Pause

MR. FUNDAREK: Peter Fundarek for the record.

There is an obligation on Isologic as the licensee to report to the CNSC. The steps that the hospitals took were completely appropriate and according to their procedures and the requirements. They notified the company that there was contamination found on the package immediately after finding that. So those three hospitals did exactly the right thing and they took the appropriate measures.

Isologic failed to report the incident to the CNSC on August 12th when it first happened and did not report it to the CNSC until two days later, on

August 14th. So that is one of the issues that we are continuing to follow up on, why they did not report the incident immediately, as is required by the legislation. It doesn't say within 24 hours, it doesn't say within two days, it says immediately.

THE PRESIDENT: I get that. I get that and I accept that. I am just surprised that the RSOs -- you know, we always look at the hospital RSO as our interaction point to the CNSC. We meet with them. We have their report. So I am still digesting here the fact you are telling me it is not a requirement for them to report any contamination in the hospital. I find it very strange.

MME SIMONEAU : Juste pour une information additionnelle. Lucie Simoneau, pour information.

Suite à la révision du rapport que le titulaire nous a soumis, qui était le 14, qui était très, très court, j'ai fait venir le titulaire au bureau de Laval, et on lui a demandé de nombreux détails suite à l'incident, ce qui a démontré qu'il n'avait fait aucune investigation, aucune analyse de cause profonde suite à ça. Donc, on a exigé que le

titulaire nous produise un rapport complet avec la chronologie de l'événement, the root cause analysis, les étapes qu'il va prendre pour empêcher que ça se reproduise, donc, un vrai rapport. Puis c'est là qu'on lui a demandé de le soumettre une semaine plus tard, qui était le 17 octobre. On a vraiment pris action avec le titulaire pour qu'il réagisse, parce que, autrement, pour lui, son rapport était complet et final.

LE PRÉSIDENT : C'est un autre cas...

Il me semble que c'est un autre cas d'avoir une inspection tout de suite, sans attendre pour un rapport complet.

Ms Velshi...?

MEMBER VELSHI: What rating did you give this event, your initial rating?

--- Pause

MS MURTHY: Just for the event, for the radiological impact alone, the event would be low, but because of the extent of the contamination and because of the fact that the event continued unmitigated for so many days we would increase its risk level to medium or high. I don't have the

information in front of me.

MEMBER VELSHI: And how did you know that the driver's hand was contaminated for whatever period of time on August the 12th?

MS MURTHY: Kavita Murthy for the record.

I think this followed from the discussions we had with the licensee once we had understood the extent of the problem. The initial report that they submitted to us, like Ms Simoneau said, was a message that was sent in spite of the person being absent and then we had very little information related to what exactly had happened. And it's only after contacting the RSO and then talking to the RSO at the hospital and talking to the licensee Isologic itself that we understood this was probably what had happened.

The hands of the driver were found to be contaminated because that was later checked, on the 12th, I believe. Lucie will correct me if I'm wrong, but on the 12th there was contamination found on the hands of the driver.

MR. RABSKI: Henry Rabski for the

record.

The company did confirm at a later date that they did check the driver when he returned back from the delivery that his hands were indeed contaminated. So that has been part of the information they have supplied when they came to the meeting that we arranged October the 9th, I believe.

MEMBER VELSHI: So August 12th and then you get notified on August the 14th. I'm just wondering why the Commission had not been notified of this when we had our meeting in October, early October.

MS MURTHY: Kavita Murthy for the record.

Like I said, it was very difficult based on the information that was coming from Isologic to really understand the extent of the problem. Then when we had the meeting with the RSO on October 9th was when we pieced together all the information, all the chronology of what had happened and really understood how serious the situation was. So at that time we did not -- when it first happened, nothing gave us the impression that there was this sort of a

bigger issue going on.

MEMBER VELSHI: I think what you are also hearing from us is the CNSC needs to look at its response plan as well and was it appropriate in this case, and waiting from August 4th to October 7th when you got some kind of a report seems like a long time for things to have happened and it's not clear from the report or the presentation so far that the CNSC took any steps to ensure that they were following their procedures in the interim. The report just says, well, clearly they put in controls because there were no additional events as opposed to hey, we reminded them, you need to do all these things or else kind of thing.

So again, when you get the detailed report and we get briefed, we will see details on that.

THE PRESIDENT: I would just like to reinforce one other item. The early event report is not designed for us to have all the information. It can turn out to be later on a non-event, but the key is that when you have information early reporting is what we would like to see and then you worry about --

and, you know, as far as we are concerned, it should have been reported in October easily or even earlier than that, depending on the severity, and if you are going to stick around you are going to see pretty soon a very early report being produced. It's only two days old. So that is the kind of process we put in place just for this kind of event.

Ms Velshi...?

MEMBER VELSHI: And I think -- and it's more a comment than a question, is this could easily get into the public arena. If there is loose contamination and people don't even know they are contaminated -- I'm thinking of the driver, not the hospital staff -- who knows, they could be going and hugging their baby at home. Like you just don't know, right. But we will wait to see the follow-up report. Thank you.

MS MURTHY: Thank you, Ms Velshi and Dr. Binder. These are very -- you are right, I think there are improvements that we can do to the response that we gave and the questions you are asking are the questions that we have been asking as well and so we will follow up, we will give you a full report and we

will look at also our response.

THE PRESIDENT: So just on what you just said, when do you expect to be able to -- okay, so again, you got the full report October the 17th. This is now three weeks later. Has anybody read the report? Does it have all the information we are seeking? Can we make a decision on it, things like this that I expected by now for you guys to know exactly what the course of action should be.

MR. RABSKI: Henry Rabski for the record.

Yes, staff have reviewed the report. We are gathering comments to fill in the -- to have the licensee respond to some of the still outstanding questions and information and we are going to get back to them next week so that the report can be finalized. There is an indication in the report of what the root causes were. We just need further detail to finalize and complete our assessment.

THE PRESIDENT: Monsieur Harvey...?
Monsieur Tolgyesi...?

MEMBER TOLGYESI: Do we have in procedure something like in these cases there will be,

I don't know, once a month or once every two months, an unannounced inspection on this licensee, a kind of close follow-up to make sure that, you know, it will not happen again?

MS MURTHY: Kavita Murthy for the record.

Our inspectors have the authority to inspect any facility any time of day, any day they want, and so a part of our compliance strategy with licensees -- this licensee and licensees who have serious issues with compliance is to do more frequent inspections. Also, we can ask them to produce monthly reports of checks they have done and there is a variety of compliance tools that we can use.

MEMBER HARVEY: So I hope you will use that.

Just tell me, you know, we were talking about annual reports just a few minutes ago and we were talking about events and now we are in November, so the year end is a very close, you will start your annual report for 2014. How will you register this event in next year's stats? Is it one event or, I don't know, it happened over three days,

three events or there were 11 packages delivered, I don't know how many places, three or four places. So it's kind of maybe eight or nine events, you know.

THE PRESIDENT: You will have to wait until the next annual report.

--- Laughter / Rires

MEMBER TOLGYESI: Yes, but you know it's quite late, it will be in December next year.

THE PRESIDENT: Listen, we have to go. We have to move on because we have some people on the phone who are about to take a flight. But before we leave just one quick question. Were the packages sent back to the company? What happened to the packages that were found to be contaminated, were they sent back or were they used?

MS SIMONEAU: No, the package was sent back to the company but was decontaminated before being shipped because the licensee, the hospital who held that package found it contaminated, decontaminated it before sending it back to Isologic.

THE PRESIDENT: That's what I mean. So they sent the package back to --

MS SIMONEAU: They always send it

back --

THE PRESIDENT: Okay.

MS SIMONEAU: -- because they are the property of Isologic.

THE PRESIDENT: And I have asked that CNSC staff, I would like to revisit the RSO responsibility, the hospital RSO responsibility in this area.

MS SIMONEAU: I already did that.

THE PRESIDENT: Okay. So thank you. Thank you very much. We will be looking for the final report and for quick action really on this. Thank you.

--- Pause

CMD 14-M73

Oral Presentation by CNSC Staff

THE PRESIDENT: The next item is another event initial report concerning a refuelling error at the McMaster Nuclear Reactor as outlined in CMD 14-M73.

I understand that Mr. Heysel is

online. I'm checking technology.

Mr. Heysel, can you hear us?

MR. HEYSEL: I can. This is Chris Heysel and Dave Tucker from the University.

THE PRESIDENT: Okay, thank you.

The CNSC has a presentation. So I understand Mr. Newland will say a few words about this. So the floor is yours.

--- Pause

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

I have with me today Mr. Christian Carrier, Director of the Nuclear Laboratories and Research Reactor Division, Mr. Pierre Tanguay, a Senior Project Officer with the same division, and other project staff.

We are here today to present the event initial report for an incident that occurred at the McMaster Nuclear Reactor.

On October the 8th, McMaster

University staff notified the CNSC of an error that occurred during the refuelling of the reactor. CNSC staff is bringing this event to the attention of the Commission because of its significance as it could have resulted in radiological releases within the facility and it is of significant public and media interest potentially.

I will now pass the presentation to Mr. Christian Carrier to describe the event and the actions taken by McMaster and by CNSC staff. Thank you.

MR. CARRIER: Good afternoon, Mr. President. My name is Christian Carrier and I am the Director of the Nuclear Laboratories and Research Reactor Division.

Just as a brief background, in case you did not remember, the McMaster Nuclear Reactor, or MNR, is located on the campus of McMaster University in Hamilton. It is a light water-cooled reactor, a pool type reactor with a maximum operating power of 5 MW. It is located inside of a concrete containment building. The reactor, although it is rated to 5 MW, normally operates at 3 MW.

The reactor has been in operation since 1959 and is currently used for teaching, research, neutron radiography and medical isotope production. The facility has just recently been relicensed for a period of 10 years.

The event we are bringing to the Commission today occurred on October 8th during a fuelling activity at the reactor. Fuelling operations are common and they ensure that sufficient reactivity is available in the core for normal operation and to ensure maintenance of an appropriate flux profile in the core. Fuelling operations occur about every second month, so about six times a year.

The specific fuelling activity for this event consisted of the permutation of two fuel assemblies that were already present in the core. We provided handouts that better explain the fuel movement during this event. It is relatively important. I don't know if -- it's not in my presentation.

--- Pause

MR. CARRIER: There we go, got it. Sorry for that, it was a last-minute preparation.

What you see is a top view of the reactor core. The core is comprised of 54 possible fuel locations arranged in a 6 x 9 reactor grid. Usually 35 to 40 fuel elements are used in the core. The remaining core locations are used for graphite reflector elements, neutron source, neutron detectors or can be used as irradiation sites for isotope production.

Each fuel is about 2.2² inches, or 5 x 5 in the metric system, and are assembled side by side. Fuel is inserted in the grid plate through a circular snout that ensures flow of water in the common plenum located at the bottom of the core. The flow is from top to bottom.

For the specific fuelling activity that was planned on that day, one of the empty irradiation sites located in the core was used as an intermediate location. This location is shown in red. It is what we call an iodine-125 production irradiation site. This was used for the first fuel element transfers, so basically you look at location B7 to D7.

By error, the fuel located in the

irradiation site was left in place after shuffling. Instead, by error, the operator latched into the neighbouring fuel element that was located at location E7 and basically put it back into the original location of D3. So you can see the logic 1, 2 and 3 on there.

One important factor in this event is that the irradiation sites are capped and are isolated from the force flow. In other words, there is a cap at the bottom, so there is no gravitational flow going through those locations as you do not expect to have fuel in those locations.

So, as a result, the fuel element that was located in the irradiation site was left without forced cooling.

The reactor was then restarted at its normal operating power of 3 MW in this configuration. Shortly thereafter, the operator noticed the bubbles coming out of the core and presence of fuel in the irradiation sites. He quickly called in the Manager Reactor Operations who instructed him to actuate a manual trip for the core.

At the time again of the reactor trip,

the reactor had been in operation for a total of five minutes at 3 MW in that configuration. The initial concern was integrity of the fuel element, that it was exposed without forced cooling and it could have been compromised.

McMaster staff removed the affected fuel and visually inspected the fuel for damage. Although no physical damage was observed, visual inspections were limited because they are limited to external surfaces of the fuel elements.

So if you look at the following slides, these fuel elements are pretty intricate in their design. They are comprised of 18 fuel elements, 16 of which contain fuel and they are only separated by 3 mm. So getting an inspection inside of those fuel elements is really not easy.

So in view of the event and in doubt of the fuel integrity, the licensee decided to tag the element and quarantine it. Radiation fields were readily taken for potential presence of fission products in the pool and no detectable increase in fission product concentration was detected.

Neighbouring structures in the core

comprised of graphite and other fuel were also visually inspected and confirmed with no observable damage.

McMaster staff assessed the situation and was satisfied that the core could be refuelled and operated safely. The core was refuelled and restarted using normal process, including associated start-up testing.

After restart, McMaster staff notified the CNSC project officer of the event. So to give you a bit of a timeline, the event occurred at around 9 o'clock in the morning, the core was restarted around 11:00, 11-ish in the morning, and a call was given to the project officer noonish time. So timing of reporting is not an issue here.

Following further discussion with CNSC staff and analysis of the situation, McMaster staff realized that conditions had not been met for restart. The operating limits and conditions for the facility require in such circumstances that restart of the reactor be approved by both McMaster University, NFCC, or Nuclear Facilities Control Committee, and the CNSC. On the following day of the event, the reactor was not

restarted and remained shut down pending necessary approvals.

MNR proactively disclosed the event on its website. McMaster staff developed a safety case supporting reactor restart and submitted it to the University Nuclear Facility Control Committee. After approval by the NFCC, CNSC staff also reviewed the safety case and found it satisfactory. CNSC staff authorized reactor restart on the afternoon of October 10th.

Follow-up activities conducted by CNSC staff included a fact-finding visit that was conducted on October 28th. During the visit, CNSC staff confirmed that there was no evidence of radiological release from the event, either in or outside of containment. Of course this was by review of the monitoring records of samples of the pool of water.

CNSC staff confirmed that MNR verified the conditions of the components in the core and that the suspected fuel assembly remain tagged and under quarantine. CNSC staff reviewed logs and instrumentation readings to better understand evolution of the event. Finally, interviews with

McMaster staff were conducted to better understand circumstances of the event and review adherence to inappropriateness of fuelling procedures.

Early observation suggests that procedures in place for refuelling may not fully reflect current practices in the field and have not been updated for quite some time. Also, observations suggest that procedures could benefit from industry experience acquired over the years in the areas of verification and incorporation of human error reduction tools and techniques.

McMaster University has established an independent investigation team to determine the root causes of the event. The investigation includes experienced industry experts. CNSC staff expect that the investigation will identify the causes of this event and will provide a solid corrective action plan to prevent reoccurrence of the same or similar events.

As part of its approval to restart the reactor, the NFCC required that key refuelling procedures be updated before new fuelling operations were conducted. This has not yet been completed and no further refuelling activities have been completed

since then.

CNSC staff will review the updated fuelling procedures and attend future fuelling operations to confirm their implementation.

CNSC staff will review the root cause analysis report once available and ensure implementation of corrective actions.

CNSC staff will inform the Commission on the conclusion of the root cause analysis and on the implementation of associated corrective actions in the next annual performance report for MNR. This report is currently scheduled to be presented to the Commission in December 2015.

Thank you. We are available for your questions.

THE PRESIDENT: Thank you.

McMaster, do you want to add anything to this before we get into the question period?

MR. HEYSEL: I just want to acknowledge that staff, in my opinion, has provided a thorough and accurate summary of the event and of course we acknowledge the serious nature of the event and I want to assure you that this is being treated

with the appropriate priority by the senior management team here at the University.

THE PRESIDENT: Thank you.

By the way, as an aside, the graphics was a godsend because I --

--- Laughter / Rires

THE PRESIDENT: So thank you for that.

Ms Velshi...?

MEMBER VELSHI: Thank you.

For staff, when I look at the reporting criteria in the EIR, it says it is something that could receive substantial media coverage, a high public visibility, but isn't the greater criterion the fact that this could have been a significant radiological risk and that's why it's an event that's getting reported?

MR. CARRIER: Actually, we put both reasons. I'm not -- I don't recall which one we put in precedence over the other. Oh, I forgot -- you may be right.

MEMBER VELSHI: Yes. The copy that we have --

MR. CARRIER: That's what we wrote

originally. Our thinking about this event has evolved over time a bit, I have to say. Yes, I do agree with you.

MEMBER VELSHI: Is it common practice for the operator to be around? I'm just wondering if he had not seen the bubbles, is this something that could have been undetected for a long period of time, that the fuel bundle wasn't in the right place?

MR. CARRIER: I will correct the first statement and I do apologize for this. I think it is an event that could have resulted in a radiological release from the core. Significant, but potentially significant to the public, I would reserve my comments on this. The reality is that the containment building is basically slowing down or blocking and this event is currently bounded by -- this event is not covered by the current safety analysis report. The safety analysis report did not envisage that such a thing could occur, but it is being bounded by a flow blockage of one single fuel element.

In looking at the potential consequences for some of those events, a student in the University campus staying there for a month would

get way less than one microsievert. So, you know, there are protective measures in place that basically bound this thing.

However, this event could have been annoying for management inside the containment building and, as you know, when events occur you don't quite understand always what has happened. So most likely if the radiation fields go up, they would shut down the reactor, potentially evacuate and then the questions start being raised. So it creates a bit of a confusion, initiation of activities, and the public media, the public attention could be inflated in this context.

Now, the specifics of this event is such that the consequence to the public would not have been likely to be significant. So that is to your first question.

What was the second one? Sorry.

MEMBER VELSHI: Is it typical for the operator to be around?

MR. CARRIER: Okay. The operator had to go back to the core irrespectively after reactor restart simply to remove the fission chamber that is

located at the periphery of the core. So it is a normal process for the operator to go back. And as part of the process, the operators go every 30 minutes to look at the core. So it could have lapsed a certain period of time, but eventually this thing would have become noticed.

If the event had not become noticed and evolved quicker, my past experience with this facility is any minute fuel defect on the sheet failure is getting readily detected simply because of the sensitivity of the radiation monitoring and fission product detectors in the pool.

MEMBER VELSHI: So it would have been the local monitors or is there a control room enunciation?

MR. CARRIER: I'm sorry, could you repeat the question?

MEMBER VELSHI: If the operator had not been there and detected it, and you said radiation fields would have gone up, monitors would have gone off, is there an enunciation in the control room that would have warned the operator?

MR. CARRIER: Yes. And actually there

is a trip on fission product detection in the pool, so the reactor would have tripped -- oh, sorry, should there have been fuel failure, of course.

THE PRESIDENT: Okay. Again, I would like to jump in there. I thought post-Fukushima we accepted the notion of beyond design event. I like to call them my doomsday scenario. I want to know what would have been -- if the operator didn't shut it down, what could be the doomsday scenario here from you and from McMaster?

MR. CARRIER: Which one do you want to be first?

THE PRESIDENT: Go ahead.

MR. CARRIER: Okay, I will start myself.

Again, I think this event is bounded by a complete flow blockage in the reactor core that is covered by the safety analysis report. I don't have the exact values myself, but the classical scenario for those pool type reactors is sheet-like objects floating, you know, buoyancy flow in the core and basically sticking on top and blocking the water flow inside of -- on the fuel channels. That prevents

cooling, boiling and basically failure of a number of fuel plates, and basically there are provisions in place to automatically trip the reactor on fission products. That is why they do this.

The consequence of such events, again, is less than one microsievert to members of the public. Again, the management of the event inside the containment building is annoying, but provisions are in place to have minute doses to members of the public for such bounding events, if you wish.

THE PRESIDENT: McMaster, you don't see any such situation that will cause a venting requirement?

MR. TUCKER: It's Dave Tucker from McMaster University.

No, we do not. We think that the description by Dr. Carrier is accurate. The dose to a member of the public in such an event would be less than a microSievert and, in fact, that assumes a partial failure of containment through the early phases of the accident that's worked in to the worst-case scenario in the safety analysis report for this type of event.

THE PRESIDENT: Thank you.

Ms Velshi...?

Okay. Monsieur Tolgyesi?

MEMBRE TOLGYESI : Pas de question.

THE PRESIDENT: Monsieur Harvey...?

MEMBER HARVEY: Just one point.

I was surprised, if I heard it correctly that such situations, such an event has not been taken into consideration in the establishment of the safety case of the -- maybe I'm not exactly --

MR. CARRIER: Well, I did say that the -- you see the safety analysis does not proceed by analyzing every potential permutation of possible events occurring at a facility. It usually proceeds by analysis that are bounding for the worst-case scenario.

So I will say that we will be looking into the appropriateness of using those irradiation sites for fuel shuffling and, actually, currently McMaster is prevented from using those irradiation sites for shuffling. It is just mentally thinking about it, you know, it calls for a potential incident waiting to happen.

So, no, it was not analyzed in the safety analysis report but it definitely is bounded by a worst scenario.

MEMBER HARVEY: How many -- how often -- how many times a year or a month are you the operator doing -- replacing the fuel --

MR. CARRIER: Fueling operations have different extents so there can be fuel shuffling. There can be refuelling. There's also more complex changes that involve control rod replacement and assemblies that are associated with it. But normally we expect about six changes -- six interactions with the core basically in a year. And Mr. Heysel could be confirming.

MR. HEYSEL: Yes. Six is about right and it varies with, of course, our operating power and operating cycle but six -- six is about average.

THE PRESIDENT: So have you come up with clever techniques to avoid such confusion? I know that you are studying the human error kind of situation. Have you come up with any protocol that will prevent such a mix-up?

MR. HEYSEL: That's correct. This is

Chris Heysel from McMaster.

We've administratively precluded the use of those positions for refuelling operations. We're updating our procedures to include some extensive self and independent verification steps and we're currently looking at a physical change to those positions which would basically physically prevent us from placing fuel in those locations. So right now we're administrative with verification complementing that and then in the near future we will hope to have a physical barrier there.

THE PRESIDENT: Okay. Thank you. Any other question?

MEMBER VELSHI: When is the root cause analysis expected to be completed?

MR. TUCKER: It's Dave Tucker from McMaster University.

Our priority is to ensure a thorough investigation and, as mentioned, we have -- the university has appointed a team including outside industry experts. So we want this to go as quickly as reasonable but we want it to most of all to be a thorough investigation. So we haven't established an

absolute endpoint but we have committed to provide regular updates to the project officer on the progress of the investigation.

MEMBER VELSHI: So remind me. You said no fuelling of shuffling of fuelling until the procedure is revised, but the root cause analysis doesn't need to be completed.

MR. TUCKER: That's correct. The preliminary corrective actions will -- are focused on preventing this event from happening again. I think the root cause investigation will look deeper and broader to prevent similar events from occurring.

So there was conditions in our approval to restart from our internal committee to have those procedures updated with measures in place to prevent this event from happening again. So we're working hard on that.

MEMBER VELSHI: And is your root cause analysis also looking at how the restart happened without following the appropriate approval channels?

MR. TUCKER: That's correct. They are going to look at the operator error associated with a fuelling incident as well as the decision-making

process for restart.

MEMBER VELSHI: Thank you.

MR. CARRIER: I would just like to add one last thing. I would like to point out that the investigation is not conducted by the McMaster Nuclear Reactor. It is conducted by the McMaster Nuclear University. We have been informed last week of the composition of that team and, again, I confirm that they are industry experts in this field.

So we are encouraged by the composition of the team and by the apparent enthusiasm in conducting that activity. But again, the people we will be talking to on progress on this thing will be the reactor but we will keep the university in the loop.

So I do share your comments regarding a timeline for completion. Again, we don't want to apply pressure. We want to have a good report and a good path forward on this one. But I think we need to put something on the record that actually we expect the university to look into it.

THE PRESIDENT: Yeah. You -- whatever final reports will come in with some recommendation

will you get an opportunity -- will you have to approve the final configuration and procedures?

MR. CARRIER: We will be looking at the root cause analysis and the proposed corrective action plan to judge acceptability but we normally do not approve, correct. We accept adequacy of the measures in place and the proposed measures in place as corrective actions usually. But there is no formal approval process per se.

MR. HEYSEL: This is Chris Heysel from McMaster.

I just wanted to comment on the timeliness. I can certainly talk for the university when I say that this is being instituted at the senior management level so certainly it has a high priority for the university and the team that's involved.

Also, I can assure you that there is going to be no shortage of resources that are going to affect the timeliness of this report.

THE PRESIDENT: Okay. Thank you. Thank you very much. We look forward to reading the final report.

MR. CARRIER: Thank you.

THE PRESIDENT: Now, I understand that we have another EIR.

--- Short pause / Courte pause

Event Initial Report

Missing Sealed Source Recovered

THE PRESIDENT: Go ahead, you guys, any time whoever wants to start this.

MS MURTHY: Good evening. I'm Kavita Murthy, for the record.

I'm the Acting Director of the Directorate of Nuclear Substance Regulations.

This EIR is a report to the Commission on an event that happened yesterday. On November 4th, 2014 the Canadian Nuclear Safety Commission discovered that a radioactive source used during an emergency training exercise that took place on August 22nd, 2014 at the Canadian Police College in Ottawa had been left behind. As part of the training session the source had been placed by CNSC trainers in a remote location on the college campus in Ottawa away from public areas.

The 3.7 gigabecquerels cesium-137 source was retrieved intact on November 4th, 2014. There was no impact on the environment. The information to date indicates that it is highly unlikely that a member of public could have been exposed to a radiation dose over the annual public dose limit of one milliSievert.

The applicant authority that is Dr. Patsy Thompson, in this case has suspended all activities requiring the use of sources.

A thorough investigation has been initiated and will be reported as required within 21 days.

A note that the 3.7 gigabecquerels cesium-137 source is considered a Category 4, a low-risk source by the International Atomic Energy Agency. This means that the source is classified as unlikely to be personally dangerous.

I have with me Mr. Peter Fundrek and Mr. Henry Rabski as the divisions that are responsible for the regulatory activities related to the licence held by the lab and I have also Dr. Patsy Thompson, Mr. Raoul Awad and Mr. Luc Sigouin available to answer

any questions that you may have.

Thank you.

THE PRESIDENT: Okay. Who wants to tell the story?

I thought that we had because of the check sources event a few months ago, not that long ago, we said our whole procedures and all inventory checks, so how does one leave, you know, a sealed source behind?

DR. THOMPSON: Patsy Thompson, for the record. I'm the applicant authority for the CNSC's consolidated use license.

If you'll allow me, Dr. Binder, I will provide a bit more additional information in addition to what Ms Murthy has provided and it may, to some extent, answer the question you have just asked.

And so as has just been mentioned, I was contacted yesterday, November 4th, by the responsible manager for the internal permit for the CNSC's licence Emergency Management Program Division's director -- as the responsible manager for that internal permit.

And so following the check source

event the CNSC licence Radiation Safety Manual was completely overhauled and a system of internal permits was established assigning responsibility to the internal permit holder, in this case, Mr. Luc Seguin, and authorized users have been identified in the permit. The internal permits have a series of procedures that must be adhered to.

I was contacted yesterday and it was confirmed at about 12:30 that a radiation source had been left in the field of the Canadian Police College. Four staff were dispatched including one senior radiation protection specialist and an authorized user under our licence to recover the source. The radiation protection specialist took radiation measurements at various distances from the source to allow an estimate of potential doses to members of the public.

The source was safely recovered and brought back to the CNSC laboratory. We took a number of actions immediately. The two radiation protection specialists were sent to the sites of two training sessions that were scheduled today to ensure that EMPD authorized users were using the procedures listed in

their permit. As per regulatory requirements the incident report was filed yesterday with a licensing officer.

On November 5th this morning a direct physical inventory verification was started at eight a.m. and has been completed. This inventory which is a procedure that was added following the check source event, was completed and the inventory confirmed that all the Type 1, Type A packages currently at the lab have contained corresponding sources.

The recovered sealed source was also leak tested as per our procedures and the test confirmed that the integrity of the source has not been affected and, in effect, the environment around the source has not been contaminated.

At 1:36 this afternoon I suspended the MPD's internal permit and all activities authorized under that permit have been suspended. The responsible manager confirmed at 4:15 this afternoon that the activities had been suspended and the sources packaged and arrangements have been made for shipping the sources back at the lab.

This is a serious event and the

limited information we have to date indicates that there has been a series of non-adherence to procedures. As we had committed when we were in front of you for the last report on the check sources, we had made a commitment to have an evaluation of our Radiation Safety Program by an external third party. That evaluation took place in the summer and the third party confirmed that the Radiation Safety Program aligns with best industry practices, but any program is only good on paper if procedures aren't being followed.

And so given the seriousness of this event I have taken steps to establish an independent team to conduct a detailed review of the incident. A full report of the event, the root causes and corrective actions will be submitted to the NSR by November 25th as required by the Regulations. Activities requiring the use of sources in the field will not take place until corrective actions have been implemented and the NSR is satisfied their regulatory requirements are being met.

THE PRESIDENT: Okay. Thank you.

Ms Velshi...?

MEMBER VELSHI: How did you find out that the source was missing?

MR. AWAD: Actually -- Raoul Awad for the record -- our CBRN officer who was in Vancouver for training to train staff from National Defence and the RCMP, when he was on the site he opened a container to verify to prepare for the training and he couldn't find the source. He thought when the last time used -- he used the source and he discovered that it was in August 22 at the police college in Ottawa.

MEMBER VELSHI: And you said you've suspended all activities requiring the source or, I guess, the licence holder for -- I'm not quite sure what specific activities you have suspended, but until all the corrective actions that ensue from the root cause analysis have been implemented. If you can tell me what are the implications of the suspension and what was that assessment done?

DR. THOMPSON: Patsy Thompson, for the record.

There are two internal permits under the CNSC licence. One is for use of sources, sealed and unsealed sources in the laboratory under

controlled conditions and one internal permit to emergency management program's division for sources that are used in the field for training first responders.

And so the action that has been taken is to suspend that internal permit and those activities. The consequences perhaps Mr. Sigouin can best speak to, but they essentially mean that the planned training of first responders has been suspended.

MEMBER VELSHI: Is it training that's suspended or you have defined other ways of training without a source?

MR. SIGOUIN: Luc Sigouin, for the record.

The impacts are on this training that had been scheduled or committed in the following months. Most of those activities involved creating radiological exercise environments for RCMP and some foreign partners of the RCMP who are going to be exercising in Canada.

There was some activities planned for training of municipal first responders. The impact of

postponing those is relatively small. The issue is more of rescheduling the trainings that have been -- that have already been scheduled and committed to because there is no one else who can offer that training or that environment for the individuals to work in.

MEMBER VELSHI: Just you know, given the last incident that we heard about or the one prior to the last one, I'm just trying to reconcile is this action precautionary -- perfect -- but is it one that's really warranted for the longer term? I mean, I can see you wanting to suspend until you have got reassurance that the patrols are in place and people appreciate what needs to be done. I'm just not sure how significant the implications are and if you really weighed the different options of meeting the requirement.

DR. THOMPSON: Patsy Thompson, for the record.

Our event, detailed event report or final event report is due to the NSR on November 25th and so by then we will have, you know, a review of the incident, identification of causes and a corrective

action plan.

So I don't anticipate unless, you know, the corrective actions are complex which shouldn't be the case, that the suspension will be for an indefinite period of time. But given the fact that this source is much more important, I guess, in terms of content and potential risk than the check sources that were left behind in the last event, I don't think we can take any chances in terms of ensuring the safety of members of the public.

THE PRESIDENT: But is the infraction systemic or an individual? In other words, if it's an individual he can hopefully find somebody else to get the training. If it's systemic then it means that, you know, something is wrong with our procedures.

DR. THOMPSON: Patsy Thompson, for the record.

This is not a -- you know, we've had a few hours since the event. The information we have to date indicates that there has been failures to follow a number of procedures and those failures are by not just one individual. And so we have to be careful in terms of making sure that we identify all the failures

and identify all the causes.

THE PRESIDENT: Ms Velshi...?

Monsieur Tolgyesi, des questions?

MEMBRE TOLGYESI : Merci, Monsieur le Président.

Ma question est unique. C'est-à-dire que ce sont les procédures fondamentalement qui sont manquées par une série de personnes, parce que je suppose qu'il y en a certains qui... cet instructeur qui a réalisé que c'est lui qui n'a pas remis la source dans la boîte, quand il a entraîné au mois d'août ici les policiers, il ne l'a pas remis. Ça veut dire qu'il l'a oublié quelque part, on ne sait pas où.

Et quand c'est revenu, la boîte est revenue à l'entrepôt ici à la sûreté nucléaire, il n'y a personne qui a vérifié non plus si la source est bien dans la boîte. Ça veut dire que quand on fait l'inventaire... et combien fréquemment vous faites l'inventaire? Parce que c'était au mois d'août, et aujourd'hui, on est rendu au mois de novembre. Est-ce que vous faites périodiquement l'inventaire physique? Ça veut dire que tu ouvres chaque boîte, tu vérifies

qu'est-ce qu'il y a dedans.

Dr THOMPSON : Patsy Thompson.

Monsieur Tolgyesi, les questions que vous posez sont très pertinentes.

Les procédures qui sont en place demandent à l'instructeur de suivre une procédure pour mettre sur le terrain les sources, récupérer les sources et s'assurer avec des instruments qu'il n'y a plus de radioactivité ou il n'y a plus de source de radiation sur le terrain. Donc, l'impression que on, c'est qu'il y a eu des manquements à ce niveau-là.

Il y a eu un manquement aussi quand les sources sont mises dans les contenants de transport. Il y a des mesures qui sont censées être prises pour confirmer la dose de radioactivité autour du contenant. Il semblerait que ça... On n'a pas toute l'information.

Puis rendu au laboratoire, la procédure normalement, c'est de vérifier avec un instrument qu'il y a quelque chose dans le contenant.

Donc, il semblerait qu'il y a une série de manquements aux procédures qui se sont passées la journée du 22 et les journées suivantes.

La semaine avant le 22 août... La semaine avant le 18 août, il y avait eu... il y a une série de vérifications qui sont faites au labo. Il y a ce que j'ai nommé tantôt, un leak test, donc, où on fait un test pour s'assurer que la source est intègre. Donc, la semaine d'avant, il y avait eu un leak test de fait sur ce contenant-là. Donc, le contenant avait été ouvert. On confirme que la source était présente et qu'elle était intègre.

Il y a eu un inventaire trimestriel de fait, mais pour minimiser les doses de radioactivité aux personnes qui font l'inventaire, on a, suite au dernier événement, mis des code-barres sur le contenant, et l'inventaire consiste à vérifier les code-barres, donc, vérifier que le contenant est au labo, et la vérification physique généralement se fait quand il y a le leak test.

Donc, suite à l'événement d'hier, aujourd'hui, les gens au laboratoire sont en train de réviser la procédure d'inventaire trimestriel pour s'assurer que c'est un inventaire physique, puis on va ajuster les doses attendues aux employés du laboratoire pour tenir compte du fait qu'ils vont

ouvrir les contenants et ils vont avoir des doses de radioactivité à la fin de l'année qui sont un peu plus élevées.

MEMBRE TOLGYESI : Quand vous dites pour minimiser la radiation, ce qui est normal, vous placez la source dans le contenant, vous vous assurez qu'elle est dedans. Quand vous avez dit que vous avez mis un code-barre, c'est un code-barre ou il y a une barrure qui la barre physiquement? Je veux dire qu'on ne peut pas l'ouvrir, seulement les personnes désignées peuvent l'ouvrir. Ça veut dire qu'on assure que les sources sont bien dedans.

Dr THOMPSON : Patsy Thompson.

Effectivement, le code-barre, c'est un code pour identifier les sources, mais le contenant est sécuritaire. Il y a des verrous, et seulement les personnes autorisées peuvent ouvrir le contenant, et toutes les sources sont mises dans un entrepôt sécurisé au laboratoire.

THE PRESIDENT: You know, this reminds me of RSI, the inventory in the hospitals, et cetera, when people felt at ease to go into the inventory, take the source and not to return it because they kept

on using and using and using.

So my question is, you have two licences, so in the licence for the training, are the training people allowed to keep the source or, after every training, they take it, they have to bring it back to the lab?

So this is more than just inventory check, which you do periodic. This is a check that you take it and somebody blows the whistle when you don't bring it back.

DR. THOMPSON: Patsy Thompson.

The procedure calls for -- the source is provided to the authorized user and there's a date identified where the source has to be returned to the lab and --

THE PRESIDENT: Can they -- can they say I'll take it for six months?

DR. THOMPSON: No. No, there's a date that is linked to the scheduled training.

THE PRESIDENT: Is it a manual system --

DR. THOMPSON: No.

THE PRESIDENT: -- or is it automatic?

So does bell go up and say, "Where is it?"

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

There's a call-up system. So it's a database, and there's a call-up system if there's -- if the source is late. So that's not the issue in this case. The source was returned, but the verification was not done that the container actually contained the source.

THE PRESIDENT: And this is a Category 4 because the first time I was informed about this, I thought it was Category 3.

So is it a Category 4? Because if it's Category 3, you have to report to the IAEA; right?

DR. THOMPSON: Patsy Thompson, for the record.

It's been confirmed by the NSR as well that it is a Class 4 -- it's a Category 4 source.

MS MURTHY: Kavita Murthy for the record.

It is a Category 4, but it is very

borderline Category 4, so it's on the high end of Category 4.

THE PRESIDENT: What does that mean? Does that mean that you have to report to the IAEA or not?

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

We -- the lost sources is part of our tracking of sources. We track, as you know, Category 1, 2 and 3, and the rest is on the annual basis.

So the reporting to the IAEA is an option activity, but we do report as part of our transparency to the IAEA on lost, stolen or even recovered sources. So the answer is yes, we'll be reporting this to the IAEA.

So the key point here, as Dr. Patsy Thompson mentioned, it's -- the key point here is the dose rate associated with this source and the seriousness of potential harm to the individual.

It's not going to be any health effect, but it's the -- the issue here is the distance and the factor that the shield itself is a quite significant shield so that, really, to miss the

verification of the container is not something that is trivial ou bien ça fait quelque chose qui est banale.

So there has been -- as Dr. Thompson mentioned, there has been a lot of steps that were not followed that really were the root -- potentially the root cause of this issue.

THE PRESIDENT: So just to cover my last question, there's -- so how long has this been missing, the source?

DR. THOMPSON: Patsy Thompson, for the record.

So the source was left in the field on August the 22nd. The container was brought to the lab, my understanding is, August the 26th -- 25th or 26th. And it was shipped to Vancouver for training late last week.

THE PRESIDENT: So it was missing from August the -- to yesterday.

DR. THOMPSON: Till November 4th it was left by a lamp post in the field.

THE PRESIDENT: In an area which you are told is not a public area.

DR. THOMPSON: Patsy Thompson, for the

record.

We have and we will be including it in our report pictures. We've interviewed -- the staff interviewed the RCMP officer who came with staff yesterday on site. And it is an area where explosives response trucks are parked, but it's not a parking -- public parking lot. It's a very low occupancy area.

But yesterday, there was a contractor who parked quite close to the lamp post.

So we have started the estimating of doses to the people who would potentially have been around the source during those 10 weeks.

THE PRESIDENT: Okay. Thanks.

Any questions?

MEMBRE HARVEY : Un commentaire.

C'est difficile de concevoir même qu'on est aujourd'hui devant un fait comme ça, d'autant plus qu'on a déjà eu un premier problème qui nous a été présenté et qu'on aurait être dû être d'autant plus attentif. On passe des journées comme aujourd'hui à applaudir un peu les résultats de ceux à qui on impose des choses et qu'on veut amener à être parfait, et soudainement, on se retrouve avec ça.

C'est un peu gênant. C'est mon commentaire.

Dr THOMPSON : Patsy Thompson.

Si je pourrais me permettre, ce n'est pas juste un peu gênant, c'est très gênant.

MEMBRE HARVEY : J'ai été un peu poli. J'aurais pu dire très gênant.

Dr THOMPSON : Patsy Thompson.

Comme j'ai dit tantôt, je prends ça très sérieusement. C'est quelque chose qui n'aurait jamais dû arriver. Les procédures qui ont été mises en place ont été évaluées à l'interne par DNSR, ont été évaluées à l'externe, ont confirmé que le programme est robuste, mais si les gens ne suivent pas les procédures, ça vaut le papier sur lequel c'est écrit.

MEMBRE HARVEY : Oui. Et c'est d'autant plus gênant que ce n'est pas des choses très complexes. C'est des choses très simples. Je comprends qu'un réacteur ou des choses comme ça, il puisse se produire des choses, mais pour des procédures aussi simples. Quand on part, on prend notre valise puis on part avec. Enfin...

THE PRESIDENT: It's always the human

factor. It's not the system, it's not the process; it's the human factor. And all the issues that we hear in all of the -- many of the DNSR issues are human factor issues, non-compliant with the rules or forgetting or some human -- and that's the most difficult thing to capture.

So we developed a system, it was assessed by a third party. Obviously, we have to go one more time and take a look and fine-tune it, hopefully.

Anyhow, we are all going to look -- the level of embarrassment for the CNSC here is high, but we've got to treat the internal licensing the same way we treat the external licensing, and we'll take our 20 lashes.

You know, somebody was asking whether we can AMP ourselves. I'm not sure that this is likely.

It's late, so we're trying to put some humour into this. But it's one of those kinds of things that would require some similar action of severity that we deploy on the people outside.

Anyhow, we'll wait for the report.

So anything else? Final comment?

Thank you.

This concludes the public meeting.

Marc, want to say something?

MR. LEBLANC: No, that's correct. And we'll resume tomorrow morning at 9 o'clock with the Gunnar Mine Commission hearing.

Thank you.

THE PRESIDENT: Thank you.

--- Whereupon the hearing adjourned at 4:25 p.m., to resume on Thursday, November 6, 2014 at 9:00 a.m. / L'audience est ajournée à 16 h 25 pour reprendre le jeudi 6 novembre 2014 à 9 h 00