

Deep Geologic Repository
Project

Projet de stockage dans des couches
géologiques profondes

Joint Review Panel
Public Hearing

Commission d'examen conjoint
Audience publique

September 9th, 2014

Le 9 septembre 2014

Royal Canadian Legion
219 Lambton Street
Kincardine, Ontario

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Kincardine (Ontario)

Joint Review Panel

Commission d'examen conjoint

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Kincardine, Ontario / Kincardine (Ontario)
--- Upon commencing on Tuesday, September 9, 2014
at 8:59 a.m. / L'audience débute le mardi
9 septembre 2014 à 8 h 59

OPENING REMARKS: JOINT REVIEW PANEL

MOT D'OUVERTURE : COMMISSION D'EXAMEN CONJOINT

MME MCGEE : Bonjour, Mesdames et Messieurs. Good morning and welcome to the public hearing of the Deep Geologic Repository for Low and Intermediate Level Radioactive Waste Joint Review Panel.

Bienvenue à l'audience publique de la Commission d'examen conjoint pour le projet de stockage de déchets radioactifs à faible et moyenne activité dans les formations géologiques profondes.

My name is Kelly McGee, I am the Co-Manager for the Joint Review Panel and I would like to address certain matters relating to today's proceedings before we begin the scheduled presentations.

We have simultaneous translation. Des appareils de traduction sont disponibles à la

réception. La version française est au poste 2. Translation devices are available at the reception desk. The English version is on Channel 1.

Please keep the pace of your speech relatively slow so that the translators can keep up. A written transcript is being created for these proceedings and will reflect the official language used by each speaker.

Transcripts will be posted on the Canadian Environmental Assessment Agency website for the project. To make the transcripts as meaningful as possible, we would ask everyone to identify themselves before speaking.

As a courtesy to others in the room, please silence your cell phones and other electronic devices. These proceedings are being webcast live. The webcast can be accessed through the Canadian Nuclear Safety Commission website at www.nuclearsafety.gc.ca.

A detailed agenda for all eight days was published on August 26, 2013 and is available on the website for this project.

Daily agendas will also be posted each day online and are available at the

reception desk to reflect any necessary last minute scheduling changes.

The hearing will begin each day at 9:00 a.m. and will wrap up at approximately 5:00 p.m.

Emergency exits are located at the back of the room and to my left behind the screen and curtain. In the event of a fire alarm you are asked to leave the building right away.

Washrooms are located in the lobby of the main entrance and the wheelchair access and ramp is located in the back parking lot.

If you are scheduled to make a presentation at today's session, please check in with a member of the Panel Secretariat at the back of the room and each member of the Secretariat staff is wearing a nametag to assist you in identifying them.

If you are a registered intervener and you want to seek the leave of the Chair to propose a question for a presenter, you are also asked to speak with a member of the Secretariat staff.

If you are not scheduled to make

a presentation during these hearings but would like to seek the leave of the Panel to make a brief oral statement, please speak with a member of the Secretariat staff and complete the application form.

An opportunity to make a brief statement is subject to the availability of time at the end of the day and must be for the purpose of addressing one or more of the six permitted hearing subjects.

Opportunities for either a proposed question to a presenter or a brief statement at the end of today's session may be provided, time permitting, on a first-come first-served basis.

In accordance with the Panel's Rules of Procedure, the resumption of this public hearing is solely for the purpose of addressing one or more of the six identified subjects. Neither presentations nor questions will be permitted if they do not follow these Rules of Procedure.

Anyone who wishes to take photos or videos during today's session should speak with the Joint Review Panel's Communication

Advisor, Ms Lucille Jamault. Lucille is at the back of the room and is there to help you with your requests.

Thank you very much.

THE CHAIRPERSON: Good morning and welcome everyone. Thank you very much for coming today.

Before I begin, I note that I am recovering from a cold so my voice may give out or become rather hoarse at times, so I apologize in advance if that happens.

My name is Stella Swanson, I am the Chair of the Joint Review Panel. I will make my opening statement, after which I will be inviting the Saugeen Ojibway Nations for their prayer and opening statement.

I would like to begin by acknowledging that we are within the area of the Chippewa of Nawash Unceded First Nation and the Chippewa of Saugeen First Nation, collectively known as the Saugeen Ojibway Nations, identified as the Anishinaabe, the specified territory they identify that they traditionally used and occupied.

I also wish to acknowledge that

the proposed project is located within Métis traditional territory, where Métis communities continue their traditional practices.

Once we have completed certain preliminary matters, it is my honour to turn the proceedings over to representatives from the Saugeen Ojibway Nations for an opening prayer and statement.

Before I proceed with my opening statement, I will introduce myself and then ask my two colleagues to do the same.

I was born and raised on a farm in Southern Saskatchewan. I became interested in biology at a very young age, thanks to my dad taking me for walks and explaining the plants and animals that we saw. I was fascinated by the aquatic insects and waterfowl in a lake near our farm. I eventually got my Ph.D. in aquatic biology and went on to work in a wide variety of subjects, all around the theme of the effects of human activities on aquatic and marine systems.

My first projects after completion of my Ph.D. focussed on the effects of uranium mining. That experience led to other work related to the nuclear fuel cycle over the

years, including serving on the Scientific Review Group to the Seaborn Panel on High Level Nuclear Waste back in the early '90s.

I view the role I am playing now as Chair of this Panel as the culmination of over 30 years of work in the environmental field. I am honoured to serve on this Panel and, as a scientist, mother of three children and loyal citizen, I am deeply committed to doing my utmost to produce, together with my two colleagues, a thorough, fair, balanced and thoughtful review of the proposed DGR Project.

I will now ask my two colleagues to introduce themselves, beginning with Dr. Archibald.

MEMBER ARCHIBALD: Thank you, Dr. Swanson.

My name is James Archibald. I was born in Northern Québec, lived in Brazil for five years with my father who was a mining engineer, and I myself am a professional engineer and employed as a Professor in the Department of Mining Engineering at Queen's University in Kingston.

I teach and have taught a variety

of subjects in the areas of rock mechanics, support design, occupational health and safety, mine ventilation and materials handling, all subjects that we are discussing through the process of these hearings.

During the course of my career I have taught over 1,000 mining engineers and have studied, researched and consulted in a wide variety of mining related areas, mostly designed to enhance the safety and effectiveness of underground mining endeavours and the safety of the human workers.

The materials that we are now considering by this process were mined at some time and place to meet societal needs -- that is all agreed upon -- and now I am working to meet the final phase of the life cycle of many of the mine materials to safely contain and sequester them in a way that will do least harm to society and the natural environment.

Thank you very much for the privilege of standing on this Panel.

THE CHAIRPERSON: Dr. Muecke.

MEMBER MUECKE: Thank you.

I was born in Berlin Germany and

have lived in Canada for over 60 years. When I was a teenager my parents emigrated to Canada and settled in Calgary. My father loved the Canadian outdoors, particularly the Rockies, and passed this love on to me.

When the trout weren't biting, which was frequently, I would scramble among the rocks and find fossils and explore the rock formations outcropping near the streams. This interest turned into a lifelong passion about anything involving geology. So my education, my grad studies were in the geosciences.

And then for the next 30 years I taught at Dalhousie University in Halifax in the Department of Earth Sciences and at the School of Resource and Environmental Studies. I taught about every subject in geology -- just about every subject in geology and published articles and did research in most of them, not always successfully.

Early in the 1970s I initiated a program in environmental geology at Dalhousie. My experience with nuclear issues started when I supervised a neutron activation analysis laboratory at Dal and at one stage I actually

held an operator's licence for a small research reactor located at Dalhousie, the SLOWPOKE-2, since decommissioned.

I formally retired from Dalhousie in 1998, but continued teaching for a couple of years and initiated a program of GIS and remote sensing for geoscientists and students in the Environmental Studies programs.

Over the years I have been involved with numerous community groups and environmental NGOs, both as an advisor and a board member. I have two previous CEAA environmental reviews under my belt. Those involved proposed super quarries in Nova Scotia, one at Kelly's Mountain and the other at White Point.

In my spare time I cultivate orchids and enjoy a wide range of music, but especially opera.

I am the proud father of two girls -- proud grandfather of two girls and two boys, who play no small part in my being here today. I see it as my duty to leave them an environmental legacy which will allow them to live full, healthy and rewarding lives in Canada.

Thank you.

THE CHAIRPERSON: I will now repeat some of the information regarding the Panel and its mandate first provided during the 2013 hearing for the benefit of those who were not in attendance last year.

The Joint Review Panel is a quasi-judicial administrative tribunal and, consequently, is independent from any political, governmental or private sector influence. Additionally, each Panel Member is independent of one another and also independent of the Canadian Nuclear Safety Commission staff.

Each Panel Member was appointed by the Governor-in-Council on the basis of their achievements and their respective fields of endeavour, their knowledge and experience as well as their reputation among peers.

Each Panel Member is required to be a temporary Commission Member of the Canadian Nuclear Safety Commission in order to have the legal authority to carry out the review of the licence application.

Each Panel Member is free of conflict and steadfastly committed to our

obligations to discharge the requirements set out in the *Canadian Environmental Assessment Act* 2012, obtain the information required to consider the licence application under the *Nuclear Safety and Control Act*, and obtain information about the adverse effects the project may have on potential or established Aboriginal rights, title or Treaty rights, as identified to us by the Saugeen Ojibway Nations and other Aboriginal groups who will be represented at this hearing.

The Terms of Reference for the Panel are set out in the January 2009 *Joint Review Panel Agreement and Terms of Reference* signed by the Federal Minister of the Environment and the President of the Canadian Nuclear Safety Commission.

This document was amended by the Federal Minister and CNSC President in 2012 to reflect the coming into force of the *Canadian Environmental Assessment Act 2012*.

This Panel is bound by the terms and conditions of that agreement and its Terms of Reference and our Rules of Procedure have been developed in accordance with that agreement.

The Joint Review Panel held

25 days of public hearings in 2013, allowing participants to discuss any matters and concerns related to the project.

In addition to those oral presentations, the Panel also received numerous written submissions, again in any matter related to this project.

When those hearings adjourned on October 30, 2013, I noted in my closing comments that the Panel had determined that we would require additional information from OPG on specific subjects.

Four subjects were the focus of the information requests issued to OPG in November 2013, namely:

methods used to determine the significance of adverse effects;

the geoscience verification plan;
expansion plans to address the earlier placement than originally planned of decommissioning waste; and

a relative risk analysis of alternative means of carrying out the project.

Two additional subjects arose later, leading to information requests issued to

OPG in February and March 2014 regarding the reference waste inventory and the applicability of incidents at the waste isolation pilot plant in New Mexico.

No particular subject led to the scheduling of these additional hearing days. All six subjects are important to the Panel.

There are three objectives for these additional public hearing days.

One, OPG and CNSC to provide their views on the six subjects and to explain their responses to information requests issued by the Panel since November 2013.

Two, Aboriginal groups, government representatives and the public to provide their views on the six subjects.

Three, the Panel to receive the information that will help it complete its assessment of the environmental effects of the project and review the application for a licence to prepare a site and construct.

The Panel is committed to the provision of fair and equitable opportunities for all hearing participants to present and explain the information and opinions they provided to the

Panel in written submissions.

The Panel carefully considered every written submission we received. Nothing was summarily rejected. Conditions for acceptance of submissions were communicated clearly and applied equally.

Every effort will be made over the next eight days to ensure that these proceedings are balanced, fair and respectful.

The Panel wishes to thank everyone who has prepared submissions for these additional hearing days. Your input and effort is recognized and appreciated.

Everyone scheduled to speak here today is reminded their presentations must be specifically and exclusively on one or more of the six subjects identified in the Rules of Procedure.

If you are not registered to speak over the next eight days, there may be an opportunity to make a brief oral statement, time permitting, at the end of the day. You are reminded that these brief oral statements must respect the Rules of Procedure and be directly connected to one or more of the six permitted

subjects.

Please speak to one of the staff at the back of the room for a request form. The Panel intends to make every effort to end each hearing day no later than 5:00 p.m. We'll see how that works.

As Chair I will work continuously to balance individual rights to express opinions and collective rights to participate in an effective, orderly and respectful process.

Everyone in this room has an absolute right to be treated with respect, regardless of their views. Disruption to these proceedings and disrespectful behaviour will not be tolerated. Anyone who chooses to continue such behaviour or otherwise disrupt proceedings may be asked to leave this hearing and be barred from returning. The Panel sincerely hopes that this will not be necessary and notes that this was not necessary in the first 25 days of public hearings.

When the Panel has determined that we have all the information that we need, we are obliged to submit a report with recommendations to the Federal Minister of the

Environment. This report will be based on all of the information submitted prior to this hearing along with all of the evidence presented during this hearing and the hearing held in 2013.

Subject to the Minister's decision on the Panel's report, the Panel may then be authorized to render a decision on the application for a licence to prepare the site and construct the DGR. The authority to proceed with a licensing decision is subject to the Federal Minister's decision on the Panel report.

Based on this joint function, all of the information received and reviewed by the Panel is intended to address both the environmental assessment obligations and licensing functions assigned to the Panel.

The Panel will ask questions and collect information until we have everything necessary to carry out our duties, including writing our report to the Minister of the Environment.

It is a key role of the Joint Review Panel to ask questions. As noted in both the Joint Review Panel Agreement and the Public Hearing Procedures, proposed questions from

registered participants must be directed through me and may be permitted, subject to a number of considerations, including my determination that the information sought is required, the question relates to the presentation that has just been made, and there is time available. Participants are asked to keep their questions as succinct as possible.

No one will be exempt from the requirement to ask a proposed question through the Chair. Please speak to one of the Secretarial staff at the back of the room if you wish to register your request to present a proposed question.

The opportunity to present a proposed question is not to be used to make a statement.

The Panel reaffirms its commitment to ensuring that this hearing will provide for meaningful participation by the Saugeen Ojibway Nations and other Aboriginal groups, thereby providing the Panel with opportunities to appropriately consider Aboriginal and traditional knowledge.

Today the Saugeen Ojibway Nations

will be making an introductory statement and opening the proceedings with a prayer.

Chief Roote, Chief Chegahno, welcome. The floor is yours.

PRAYER AND OPENING REMARKS:

SAUGEEN OJIBWAY NATIONS

PRIÈRE ET MOT D'OUVERTURE :

NATIONS SAUGEEN OJIBWAY

CHIEF ROOTE: (Native language spoken / Langue autochtone parlée)

My name is Chief Vernon Roote from Chippewa of Saugeen. I'm joined by Chief Arlene Chegahno from Chippewa of Nawash. Together we form Saugeen Ojibway Nation of the Saugeen Territory.

I would like to open these proceedings up with a prayer to show respect for the Creator and the guidance for everyone.

Remain seated.

(Native language spoken / Langue autochtone parlée)

The prayer, Madam Chair, is to ask God to help us understand why we are here as

human beings on Mother Earth and for us to look after Mother Earth to be able to look after the air that we breathe, to be able to look after the food that we get from the ground; to be able to give thanks for the clean water that's made for us to drink and that it is our responsibility to keep all of those three basic items available for us to the best of our ability, and to give thanks for the territory that we, as the Saugeen people, were given to look after and give thanks for that.

And I welcome everybody that comes to the territory to enjoy the territory to live on so that they are able to function as the human being that they were put on Mother Earth for.

I gave thanks for everything that I could think of this morning, for those people who are in hospitals that are sick and for those other people around that are not here.

So we give thanks for everything that we are given whether it be good or bad and to also understand that our belief in the Spirit is one and God as our Creator.

We also sang some songs and we

also had a pipe outside this morning also of the same nature to give thanks and to give that recognition to the Creator of the teachings that were given to us to be able to show example but also to be able to experience that jurisdictional right that was given to us by the Creator to give prayer through the use of the tobacco and through song.

So today we are here with members of our people. And as the case was a year ago, our communities come here today as both a demonstration of support and strength but also out of deep concern, a concern that decisions that are being made today will impact us forever, a concern that the matters we are discussing in these proceedings are serious and without precedent in the history of our community, our territory or this country for that matter.

Finally, I believe that these decisions cannot be made without our central involvement and participation. Again, we come here today with tough but open minds and deep concern over our future. And again, we ask all those here today to share with the same mindset.

Now, I would like to introduce

our fellow Chief Arlene Chegahno and ask her to say a few words.

CHIEF CHEGAHNO: Thank you, Chief.

Arlene Chegahno, Chief for the Chippewas of Nawash First Nation.

As I said almost exactly one year ago, the possibility of the DGR project in the heart of our traditional territory is of the greatest significance to our people and future.

Our participation in this process over the years and our engagement with OPG has been for the sole purpose of ensuring that this project does not create new risks for our people, our territory or our future.

As people we have a duty to protect our lands, waters so that our future generations can continue to rely on the territory to sustain themselves spiritually, culturally, physically and economically.

As Chief I have the duty to ensure that this fundamental right of our people is respected and that our voices are heard.

As you have heard, OPG and SON have committed to each other to engage in a

cooperative and collaborative process to allow our communities to understand the DGR project and determine whether our communities support the project. We have also agreed to consider the project now proposed in a broader context of the nuclear issue facing our territory historically, today and running into the future.

SON has been clear from day one that any plan for dealing with low and intermediate level nuclear waste must be part of a comprehensive resolution of nuclear issues within our territory. If not, it will only act to add to our problems rather than resolve them.

The Panel determined last fall that it did not yet have enough information on which to make its recommendations for the project. We agree. There are still many outstanding questions.

OPG has now provided more information. Some of the new information provided helps our communities understand the project better. But we must be honest. There are still many unanswered questions and our concerns have not yet calmed. We still have confidence that we or the Panel has both information on the

scope of the project or its potential risks.

We are here again for two more weeks of hearings. To repeat the words of Chief Roote, we will keep an open mind and continue to consider the issues seriously. But we will also test what we hear. It is our duty to our people, the territory and our future.

I wish to leave with the same thought that we opened these proceedings with a year ago. The DGR project is a forever project. If it goes ahead it will forever alter the physical and spiritual landscape of our territory. It will become a part of the history of the Saugeen Ojibway people for all times. I ask that we all take a minute to understand this and to hear it in our mind over the next coming week.

Megwich. Thank you for the opportunity to speak.

THE CHAIRPERSON: Thank you very much, Chief Roote and Chief Chegahno. Appreciate your remarks.

We will now proceed with presentations by Ontario Power Generation, the Canadian Nuclear Safety Commission and the

Ontario Ministry of Labour pertaining to the subject of the applicability of recent incidents at the Waste Isolation Pilot Plant to the safety case for the DGR project.

The Panel has decided today that we will save our questions until after all three presentations have been completed and then, time permitting, questions submitted by registered participants who will be considered by me.

Participants are reminded that questions must relate to today's presentations.

The first presentation will be by Ontario Power Generation. Ms Swami, please proceed.

**PRESENTATION BY / PRÉSENTATION PAR
ONTARIO POWER GENERATION**

MS SWAMI: Good morning, Dr. Swanson and Members of the Panel.

For the record, my name is Laurie Swami. I am the Senior Vice-President for OPG's newly-created Deep Commissioning and Nuclear Waste Management Business Unit.

My responsibilities include

nuclear waste management, regulatory affairs and developing and implementing the programs and plans for the shutdown and safe storage of our Pickering Nuclear Facility.

I am joined for the continuation of this hearing by a number of OPG staff members and staff from the Nuclear Waste Management Organization:

Sitting with me is Derek Wilson, NWMO's Vice President for Design and Construction and the DGR project.

Frank King, who joined us last year, will no longer be part of the team as he retired shortly after the hearing days in 2013, and we wish him well.

Lise Morton, OPG's Director of Low & Intermediate Level Waste Operations will deliver our presentation this morning.

Before beginning I would again like to thank the Elders, Chief Roote and Chief Chegahno for their prayers this morning.

I would also like to thank Mayor Kramer for continuing to host this hearing in Kincardine. Thank you.

MS MORTON: Thank you, Dr.

Swanson, and good morning.

For the record, my name is Lise Morton, Director of Low & Intermediate Level Waste Operations for the Deep Commissioning and Nuclear Waste Management Division of Ontario Power Generation.

I will provide a summary presentation on OPG's response to EIS-13-515 on the recent events at the Waste Isolation Pilot Plant, or WIPP, located near Carlsbad, New Mexico.

I will first provide a brief outline of the information request.

Then, I will provide an overview of how OPG considers operational experience.

For both the February 5th fire and February 14th radiological release incidents I will discuss OPG's understanding of the status of the investigations as posted by the U.S. Department of Energy, the relevance to the DGR and the applicability to current OPG processes.

I will also provide a brief discussion of safety culture at OPG.

Information Request EIS-13-515 asked for a brief description of the two February

incidents at WIPP and the relevance of these incidents to worker and public health and safety at OPG's proposed DGR under both normal and accident conditions. It further asked whether or not the consequences of these incidents fall within OPG's modelled analysis of accidents, malfunctions and malevolent acts.

We at OPG take the events that occurred at WIPP very seriously. Whenever significant events occur at any other nuclear facility worldwide we obtain available information, assess and analyze these events thoroughly so that we can understand how they impact our own operations.

The nuclear industry worldwide very willingly and openly shares information due to the unique nature of our business. OPG immediately began gathering information on the WIPP events, contacting industry peers and assessing the impact on both current and future operations.

There is a formal operating experience, or OPEX process, at OPG and within the Nuclear Waste Management Division itself. On a weekly basis events that have occurred both

internally to OPG and externally within the nuclear industry and other industries are reviewed by the Nuclear Waste Management team. As required, specific actions are taken to validate, confirm or incorporate any relevant lessons learned.

As Director of Low & Intermediate Level Waste Operations at the OPG Western Waste Management Facility, I understand how serious the events at WIPP are and how critical it is for us to learn from them in our current facility. It is important that we understand what happened so that we can assess our own operations and identify any vulnerabilities we might have.

For example, we have a cross-functional fire team and we immediately reviewed the WIPP fire event report with them so that staff in engineering, operations and maintenance understood the event and its significance.

We sent key staff to WIPP after the events to get firsthand understanding of what happened, what the U.S. Department of Energy or DOE has learned from these events and what is being done in response.

We monitor the published DOE

information on a daily basis in order to stay abreast of all new developments.

We have also chosen to include the WIPP fire event as a case study for all of our nuclear waste staff for training sessions later this year.

In the following slides I will provide an overview of each of the WIPP incidents and I will also identify some of the processes we have in place to mitigate and/or respond to similar events. I will also review OPG's assessment of the potential impacts on the DGR.

A detailed investigation report on the February 5th underground fire at WIPP was published by the United States Department of Energy on March 13th.

In summary, at approximately 10:45 a fire started on and was confined to a salt handling truck from a buildup of flammable fluids such as diesel or hydraulic fluids coming into contact with hot surfaces on the equipment. The employee attempted to suppress the fire manually with a handheld extinguisher and subsequently through deployment of the onboard fire suppression which had previously been

disabled.

When the fire did not extinguish the operator notified maintenance personnel. The supervisor and other workers were made aware of the fire through the mine phone system. The central monitoring room was notified of the fire and a series of activities was undertaken to notify underground personnel to evacuate to surface via the waste hoist.

By approximately 11:35 a.m. all underground personnel had been accounted for at surface and medical attention provided to some staff for smoke inhalation. Six workers were transported to the Carlsbad Medical Centre for treatment of smoke inhalation and were released three hours later.

During the emergency evacuation the underground ventilation scheme was inappropriately changed from normal operation to filtration mode. This resulted in some areas underground that are expected to have clean airflow to be filled with smoke from the fire. This impacted worker's ability to reach the waste hoist due to poor visibility and others had difficulty donning their self-rescuers.

There were two separate entries by the mine rescue team to the location of the fire to determine if it was extinguished and to perform gas checks of the mine air.

Approximately 12 hours after the event, air quality readings confirmed that the air was clear and that the fire was extinguished. The emergency operations center was terminated at 1:05 a.m. the following day.

The U.S. Department of Energy published an investigation report on March 13th which concluded that the accident was preventable. The root cause was identified as failure to adequately recognize and mitigate the hazard regarding a fire in the underground. This includes the recognition and removal of the buildup of combustibles through inspections and periodic preventative maintenance and the decision to deactivate the automatic onboard fire suppression system.

The DOE report also identified 10 contributing causes to the incident that have been summarized into key findings shown on this slide:

Inadequate maintenance practices:

For example, the maintenance program did not prevent or correct the buildup of combustible fluids on the salt truck. It was also noted that there was a distinct difference in the maintenance practices between waste handling and non-waste handling equipment.

Inadequate fire protection program: For example, requirements from the fire hazard analysis surrounding control of combustibles did not get embedded into operating procedures.

Inadequate training and qualification: For example, the salt truck operator did not immediately alert the central monitoring room of the fire and staff in the central monitoring room did not fully follow the procedures for an underground fire.

The preparedness and execution of emergency response was ineffective. For example, the decision to switch the ventilation to filtration mode which changed the expected mine airflow and filled the escape route with smoke. Also, evacuation drills had not been comprehensive. For example, they had not included donning self-rescuers.

Ineffective management oversight had allowed housekeeping to degrade and had not insured that longstanding deficiencies were corrective.

Nuclear waste partnership: The contracting operating the WIPP facility has submitted a corrective action plan to address the DOE's conclusions. Once that corrective action plan is available we will be assessing it for lessons learned and applicability.

The OPG pre-closure and conventional safety assessments considered an underground fire as a credible event. As such, many aspects of fire prevention, detection and suppression had been assessed in the design and processes for the DGR as shown on Slide 7.

These have been described extensively in the submission materials, through information request responses at the July 18th, 2012 technical information session and during the 2013 hearings, specifically, the October 30th session on health, safety, environment and management systems. A detailed list of these references was provided with the WIPP information request response.

These design considerations for fires were reviewed in the context of the WIPP fire event. No changes have been identified in the DGR design basis, but this will be reviewed again in the course of the detailed design.

The design and processes developed for the DGR project will also be subject to regulatory review and oversight, including the CNSC for compliance to the licence conditions as well as the Ministry of Labour for compliance with the construction and mining regulations.

Fire in any facility is a very serious event. As a result, we take many measures and steps to mitigate the risk of a fire. In our response to EIS 13-515, we referenced the management systems that we have in place in the area of fire.

I would like to provide some specific examples of steps that we take or elements of our program and compare them to the findings from the WIPP fire event.

First, all of our vehicles, whether they are forklifts or commercial vehicles, undergo routine maintenance and

cleaning.

We conduct routine inspections and maintenance and testing of all of our fire system equipment as is required by the National Fire Code of Canada. We regularly conduct fire drills. Last year, for example, we conducted a thorough timed drill monitored by an external consultant to confirm our ability to initiate our carbon dioxide fire suppression system in our low-level waste storage buildings and those results were provided to the CNSC.

Our operating licence from the CNSC requires that we do independent third-party reviews of our compliance to the Fire Code every two years. That means that every two years at least an external fire expert walks through our facilities, conducts a thorough inspection, reviews our records and identifies any and all deficiencies that might exist in our fire systems. We then submit those results to the CNSC and we develop corrective actions to address each one of these deficiencies.

Like any equipment, fire equipment will sometimes fail and need repair or replacement. On a daily basis at our morning

operations meetings we review any fire equipment that might be out of service and ensure that its repair is receiving the top priority in the facility. And for each and every impaired fire system, we initiate a fire impairment plan developed and communicated by our fire impairment coordinator. This includes compensatory measures which are consistent with the requirements of the Fire Code that we put in place, such as initiating fire watches, positioning temporary extinguishers in the area, limiting work that could create sparks or ignition sources and notifying the fire responders for the facility. These compensatory measures remain in place for the entire duration of the impairment and we notify the CNSC of each and every one of these impairments.

These are just some of the examples of how we implement our fire program which is very extensive and is an ongoing key focus for our operation.

I will now discuss the WIPP radiological release event. At 11:14 p.m. on February 14th, a radiological alarm was received at the central monitoring room from a continuous

air monitor located underground which monitored the exhaust from the active waste panel.

The ventilation system automatically switched to high-efficiency particulate air or HEPA filtration. There were no workers underground at the time of the alarm and 11 personnel working on surface.

Analysis of surface monitoring filters downstream of the HEPA system early on February 15th indicated that there was a radiological release from the exhaust. On-site personnel were directed to shelter in place at 9:34 a.m. There were 153 people on site at the time the shelter in place was called as day workers had arrived.

On-site and off-site surveys were initiated and additional portable samplers were installed in specific areas. Further sampling and analysis confirmed levels were not above background and the shelter in place was released by 4:35 that afternoon.

Non-essential personnel were released from the facility after they received a whole body radiological survey. Site access was then restricted to essential personnel only.

The DOE is investigating this event in two phases. Phase 1 investigated the surface radiological release and a detailed investigation report was published on April 24th.

Phase 2 is the ongoing investigation of the underground release. The root cause of the underground release has yet to be determined and will be documented in the yet to be published Phase 2 report.

The Phase 1 investigation determined that some of the exhaust air bypassed the HEPA system through the bypass isolation dampers. The measured environmental release was well below the regulatory limits. Although 22 workers were found to have measurable dose from the event, these exposures were well below the regulatory limit. However, any unplanned exposure merits extensive investigation which is consistent with how the DOE has approached this event.

Ongoing monitoring following the event confirmed that concentrations remained at levels which would not affect workers, the public or the environment.

The DOE investigation report for

Phase 1, which is the radiological release at the surface, identified the root cause as a management failure to fully understand and control the radiological hazard. The report also pointed to a degradation of key safety management programs and safety culture.

There were eight contributing causes to the incident which are summarized on this slide and were presented in the information request response.

The mine fire and the radiological release incidents were determined to be unrelated. However, as can be seen from this slide, many of the findings are very similar, such as, ineffective management oversight, a degradation of the site safety culture and systems and ineffective maintenance programs.

The DGR safety assessment has always considered a package breach and resulting radiological release as a credible scenario and it has been assessed for its impact to both worker and public safety. The assessment showed that such an incident would not exceed the regulatory criteria. In part, this is because OPG's wastes are from CANDU reactor operations

and refurbishment activities. They are much different from the waste from the U.S. weapons program received at WIPP.

The DGR design has incorporated throughout the ALARA principle, or as low as reasonably achievable. For example, the ventilation system is designed as a flow-through system where the exhaust air is directed through normally unoccupied tunnels.

OPG also has a mature radiation protection program supported by qualified radiation health physicists and with an associated extensive training program and routine monitoring.

The Phase 2 investigation is ongoing to determine the root cause of the underground radiological release. The breach of the observed waste container appears to have been caused by a chemical reaction. The investigations are focused on nitrate salt bearing waste originating from the Los Alamos National Lab. Samples of material believed to be from the breached container have been collected and sent for analysis. To date, the DOE has not been able to inspect all containers in room 7.

The investigation team is evaluating methods to obtain visual confirmation of waste integrity from rows of waste at the back of the room.

We continue to monitor the developments and information released on Phase 2 of this investigation. As more information becomes available, we will assess the implications and any required changes will be incorporated into either the design or into operating procedures.

Given the information currently known about the underground package breach, we have completed a preliminary assessment of the relevance to the DGR.

As I stated earlier, OPG's wastes arising from CANDU reactor operations and refurbishment activities are much different from the transuranic waste received at WIPP. OPG's waste streams have limited nitrate salts and they are in a different form than that of WIPP.

OPG has reviewed its radioactive waste streams for strong oxidizers and has not identified any significant sources which reduces the risk of a similar event.

The waste acceptance process is

described in more detail on the following slide. A key component to this process is the waste acceptance criteria. The waste acceptance criteria defines what wastes are acceptable for receipt and what materials are specifically excluded, such as chemically reactive materials. Relevant to the WIPP incident, acceptable absorbent materials are also defined in the waste acceptance criteria.

OPG is one of the few North American utilities that manages its low and intermediate level waste throughout its entire life cycle from waste generation at its nuclear stations through to transportation and processing at its Western Waste Management Facility and then through to interim storage and disposal.

There is a key document called "Waste Acceptance Criteria" which serves as a contract, if you will, between the nuclear generating stations the waste site to ensure that the waste received meets all requirements, including packaging, radiological characteristics, and chemical characteristics.

I will briefly describe the process that waste goes through at the stations

and when received at the Western Waste Management Facility.

All along the way, there are very specific procedures that detail the steps to be followed and the roles and responsibilities of all of the work groups involved.

Low level waste is collected at the stations in specifically designated waste containers. There are centralized waste handling areas which collect all of the waste from across the station.

Trained and qualified staff follow procedures which have been aligned with the Waste Acceptance Criteria document. They ensure that the waste is packaged, labelled and shipped according to the requirements.

The documentation accompanies every waste shipment, and waste shipments are overseen by a qualified transportation officer.

Each station also has an appointed single point of contact for waste matters so that staff know whom to contact for any questions.

In the case of intermediate level waste such as resins and filters. These are

transferred from closed loop station systems using approved procedures into the engineering waste container.

The procedures require verification at various steps along the process and, again before shipment, all paperwork is verified.

When waste is then received at the WWMF, trained and qualified staff verify all documentation and follow rigorous procedures for the processing and storage of that waste.

There has been no evidence of strong chemical reactions of the type seen at WIPP in our existing stored volumes of waste.

Over the last 20 years, there have been several large campaigns involving relocation, inspection or repackaging of wastes, which have allowed OPG to visually inspect large volumes of our stored wastes.

In each of these campaigns, there was no evidence found of strong chemical reactions having taken place.

I would like to take a moment to discuss safety culture.

The Institute of Nuclear Power

Operations, or INPO, provides the following definition:

"Nuclear safety culture is defined as the core values and behaviours resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment."

The two investigation reports from WIPP indicated the safety culture at the site.

It, of course, then begs the question how do I, as the Director of Low and Intermediate Level Waste, and my staff ensure that we maintain a strong safety culture and also don't allow it to degrade over time.

I would start by saying that maintaining a strong safety culture is an ongoing daily process that requires constant reinforcement and buy-in from the top of the house to the shop floor. There are many ways in which we do this.

For example, we have adopted INPO's 10 traits of a healthy nuclear safety culture. Each week, we focus on one of these traits and we encourage discussions with staff on the traits.

For example, one of these 10 traits is called "Environment for raising concerns". That week, we would openly discuss with staff their perspective on whether they feel comfortable raising concerns and examples of where the trait has been utilized well or not.

We have annual workshops for all of our staff where we go over a case study from the industry and challenge what happened from a nuclear safety culture perspective.

We train and reinforce our staff to use tools such as questioning attitude where they are encouraged to stop when they are unsure and question the work being performed.

OPG's performance in all areas is routinely monitored and assessed both internally and through external audits as well. The CNSC inspects our facilities three times a year and assess our operation against several safety and control areas. Human performance is one of those

areas.

The CNSC will interview staff from all working levels and will provide feedback and an assessment on our performance in this area.

Corrective action plans are developed to address findings from all assessments and actions are tracked to completion. The most critical actions have effectiveness reviews. In this way, we ensure that we are seeking continuous improvement in our programs and operations.

In conclusion, OPG has over 40 years' experience safely managing and storing low and intermediate level waste at the Western Waste Management Facility. Our current reviews indicate that there is not a need for design changes at this time.

We believe that the DGR design has incorporated the necessary measures for a possible fire event.

Further, the analyses also considered a potential radiological release which was found to be within regulatory criteria.

OPG will continue to monitor and

learn from the events at WIPP. As more information becomes available, that will be assessed and any required changes will be incorporated into either the design or into operating procedures.

OPG takes very seriously the events and consequences of the fire and radiological release which occurred at the WIPP facility February 5th and 14th.

We at OPG have a healthy, strong nuclear safety culture which we reinforce daily. We do not take this for granted, and we seek continuous improvement.

Safety is one of our core values and the over-riding priority in everything we do.

Thank you, and I welcome any questions that the Panel may have.

THE CHAIRPERSON: Thank you, Ms. Morton.

As we said earlier, we'll proceed directly with the Canadian Nuclear Safety Commission presentation. And looking at the time, after these CNSC presentation, we will be taking a break. And then after the break, we will proceed with the Ministry of Labour.

So Ms. Klassen, the floor is yours.

Sorry, Dr. Thompson.

**PRESENTATION BY / PRÉSENTATION PAR:
CANADIAN NUCLEAR SAFETY COMMISSION**

DR. THOMPSON: Bonjour, Madame la présidente et monsieurs les commissaires. Mon nom est Patsy Thompson. I'm the Director-General of the Directorate of Environmental and Radiation Protection and Assessment.

With me today are Ms K. Klassen, Senior Project Officer in the Waste and Decommissioning Division. Ms Klassen is responsible for this project. And with Ms Kiza Francis, the EA Assessment Specialist responsible for this project.

We also have a number of people on our technical review team that are present today to help us respond to any questions from the Commission.

They're Christina Dodkin, our Radiation Protection Specialist, Ms Melanie Rickard, a Dosimetry Specialist, Mr. Michael

Jones, an Environmental Program Officer, Mr. Dan Papaz, Management Systems Specialist, as well as Dr. Felicity Harrison, a Senior Human Factor Specialist, all within the CNSC.

The presentation will summarize CNSC staff's response to the Panel's request for information on the relevance of the two events that occurred at the Waste Isolation Pilot Plant, or WIPP, in New Mexico, and the relevance for the DGR project, the results of CNSC staff's review of OPG's response to the same request as well as staff's assessment of the impact of these events on our assessment and recommendations in our 2013 Panel Member Documents on OPG's environmental impact statement and licence application.

Before I pass the presentation to Ms Klassen, I would like to mention that we do not yet have all of the information on the root causes and other causes that led to the incidents at the WIPP. We will continue to review information through operational experience from a regulatory point of view.

So in short, the information we will be presenting today represents the information that is available as of essentially a

couple weeks ago.

So I will now ask Ms Klassen to continue with the presentation.

MS KLASSEN: Good morning, Madam Chair and Members of the Joint Review Panel. My name is K. Klassen.

Briefly, in March of this year the Panel asked OPG and the CNSC for information on the importance of the events that had occurred at the WIPP facility and its relation to the DGR project. The request was for a description of each of the two events that occurred in February 2014 and the relevance of each event to safety for the proposed DGR project and how the events fell within the assessments of accidents, malfunctions for OPG's proposed DGR.

The first event occurred at about 10:48 in the morning on February 5th, 2014. The driver of a vehicle used to haul salt underground noticed a fire in his vehicle. He attempted to extinguish it and then notified maintenance of the occurrence.

While several people arrived to help the driver with the fire, the facility operator sounded the emergency alarm and

announced an evacuation.

The operator completed a number of activities following the alarm, including changing the ventilation filter, changing fans, initiating emergency management, suspending surface activities and activating the mine rescue teams.

The first evacuated underground workers arrived at ground surface just after 11:00 a.m., and the last made it to surface a short time later, with the underground staff all accounted for shortly before 11:35.

By 17:22 in that afternoon, the mine rescue teams had re-entered the underground to ensure the vehicle fire was extinguished and to perform other checks. The last team existed around 1:00 a.m. on February 6th and the emergency was declared ended.

With normal underground activities halted, the investigation of the event and recovery activities were begun.

The second event, referred to as the contaminated release event, occurred on February 14 during the night shift while all staff were on surface.

At about 23:13 in the evening, an air monitor underground triggered an alarm. Dampers on the exhaust closed and the facility operators shifted the exhaust air through the high efficiency particulate filters.

Personnel initiated the ventilation and radiological alarm procedures, and stayed sheltered on surface where all were located when the alarm sounded.

Notification of radiological control and operations managers and the Department of Energy representative was completed by 3:30 in the morning on February 15, but the regular shift change occurred between 6:00 and 7:00 that morning. And between 6:30 and 9:15 that morning, the filters on the exhaust monitors before and after the HEPA filters were changed and tested.

Contamination was confirmed in the air coming from the underground area and was also detected in the air, being released to the environment.

By 15:12 in the afternoon of the 15th, non-essential personnel were permitted to leave the site after having been surveyed. And

at the request of a worker, a bioassay program was initiated.

Many of the on-site operations remained halted and planning for re-entry into the underground area subsequently began.

Following each of these events, the Department of Energy, or DOE, appointed an Accident Investigation Board to investigate the accident. The Accident Investigation Board findings for the fire event were made public in March, and the first report, the Phase 1 report of two planned by the Accident Investigation Board, was issued in May.

It assessed the release to the environment.

There have been delays in completing the event investigations due to the need to plan and stage the entry because of the contamination caused by the underground release event.

With respect to the fire, the mechanical status of the vehicle was confirmed and, over the months since the event, the status of the ground where the fire occurred has been assessed.

Soot remains to be cleared in underground areas, some underground areas, and the work is undertaken as areas are reclassified following surveys and sampling for the radiological contamination.

With respect to the release event, work to date has confirmed that there was a break in a container in the open waste management panel where the packages were being placed. There is an obvious twisted lid and discolouration on the container, suggesting a chemical reaction, from photographs of the area.

The inspection of the waste panel is continuing, and additional rows of containers are to be examined when a boom and trolley system arrives on site mid this year September.

The examination of wastes and waste packages at the site where this container was filled is continuing to confirm the process of release. There is some indication that it is associated with organics in the absorbent and other materials in the container, but this is still not confirmed.

The Phase 2 report by the Investigation Board will provide the findings

from their investigation on the underground release, but we don't know yet when this report will be made available. Meanwhile, the underground area continues to be surveyed, sampled and released for occupancy without personal -- pardon me, protective personal equipment. These areas then go into maintenance activities, including cleaning and equipment maintenance.

Both of the events have been assessed for their possible impact on workers, the public and the environment by the Accident Investigation Boards. With respect to the fire event, while a number of workers were treated on site, six workers were treated for smoke inhalation in hospital and released the same day.

There were no significant injuries that required hospital admittance. The public and the environment were not affected.

With respect to the release of radionuclides from the waste panel, 21 workers were initially reported to be affected at very low levels, and this was later revised to 22 in a May 15th update.

All affected workers received

doses less than 0.1 millisievert converted from the U.S. units, and a small fraction of -- which is a small fraction of the dose limit from 50 millisievert per year.

The estimated public dose is on the order of 0.001 millisievert and natural background in that area is 3.1 millisievert per year.

There were no injuries sustained to workers from this event, there was no contamination of surface water, sediment or vegetation.

CNSC staff reviewed the investigation reports made available to the public by the DOE on the WIPP web site. There were many observations and recommendations made by these reports and some of these more important ones are -- were identified by CNSC staff's review and are highlighted in the next slides, along with the requirements of the CNSC in relation to these observations.

Starting with the fire, the following observations were made.

The maintenance program was not effective in preventing or correcting conditions

such as a build-up of combustible material on the vehicle and the inoperable status of some alarms. This program failed to recognize the safety significance of equipment not already identified as related to radioactive waste.

The CNSC requires a preventative and corrective maintenance program that considers all risks and hazards in its implementation and management of changes. There should be no automatic separation of importance based solely on its association with the nuclear side of an activity.

The fire protection program was not effective. It did not prevent the change to the automatic actuation of the vehicle fire suppression system or the amount of combustible material above values in the fire hazard assessment located underground. It also did not address problems with maintaining proper door configurations, and some doors were chained open.

The CNSC requires an effective fire protection program, one that complies with the requirements of the National Building Code and Fire Code of Canada and to regulations under the *Ontario Occupational Health and Safety Act*,

which all expect that there will be equipment, personnel and personal training to address operational and emergency needs.

This includes the provision of refuge stations and the implementation of stench gas in addition to other alarm events. Neither refuge stations nor the stench gas appear to be - appear from the report to be the requirements of the fire protection program at the WIPP facility.

The fire hazards assessment was not comprehensive. It did not analyze all credible fire locations.

The CNSC requires, through conditions of the licence, that a fire hazard assessment be conducted in the construction phase for the facility design, that the fire hazard assessment be developed from National Fire Protection Association guidance in Standard 122 for metal and non-metal mining and Standard 801 for facilities handling radioactive materials.

Through the conditions of licence, we require that the fire system and other protective features of the facility be reviewed by a third party expert for compliance

with the requirements and, further, the effect of any changes to the design or other protective features that occur in either the construction phase or in operational phases are expected to be assessed and reviewed by that third party.

The CNSC has a fire protection specialist who participates in the review of licensee fire hazard assessments. CNSC inspectors also verifies a licensee compliance with those requirements.

Continuing with the fire event, the emergency preparedness and response program was not effective.

Actions were taken by operators at the WIPP facility that resulted in a change in the direction of air and smoke in the underground. This caused confusion and caused some of the underground workers to not follow their planned route of egress.

CNSC requires emergency preparedness and response to conform to best practice during fire events and procedures that result in immediate actions that lead to a change in air direction during a fire are considered flawed.

Workers were almost immediately directed to evacuation -- to evacuate, and evacuation was well in progress before the mine rescue teams appeared from the reports to have been activated.

Workers at CNSC licensed mines are required by their emergency preparedness response programs to report to strategically located permanent or portable refuge stations that are fully equipped with air supply, communication system and other emergency and personal protective equipment to wait for full instructions and the assistance of mine rescue teams for an orderly evacuation.

WIPP staff managing and responding to the emergency event took actions based on their experience and knowledge. The procedures were not necessarily followed, and decisions were taken without any apparent information or knowledge of conditions underground.

CNSC requires the emergency preparedness and response program to be process and systems based rather than relying on staff to make expert-based decisions under stress of event

conditions.

Taking a process and systems approach develops procedural structures that lead to obtaining the necessary information, and then to identify, characterize and classify the event and engage in well-considered and planned responses. This process of evaluation may occur more than once as conditions change and new information becomes available about the event.

Training and the qualification of workers at WIPP was not effective. Some of the observations relate to ineffective training and qualification of staff. There were workers wearing their personal protective equipment ineffectively or not at all and workers who were uncertain about what actions to take following the alarm. The facility operator also did not fully understand what would happen when the ventilation was reduced and did not follow emergency procedures.

CNSC requires the systematic approach to training for all programs. This includes: classroom familiarization with the programs and procedures; drills of procedures and with equipment to demonstrate competence with

equipment and procedures; and, large-scale exercises. The qualifications and competencies and the requalification requirements for staff engaged in activities must also be established for various positions.

CNSC staff specialists conduct thorough reviews of licensee emergency preparedness and response programs and of their training programs. Licensees' emergency preparedness and response and training programs are expected for compliance. The emergency exercises that licensees are required to conduct are monitored by CNSC staff.

Some of the lessons learned for the contaminant release event are similar to those of the fire event, for example, the inadequacies with existing emergency response and preparedness program associated with a lack of process and systems-based approach to event response, and problems with the preventative and corrective maintenance program at this time associated with the continuous air monitoring equipment that was not working or not able to remain operating during the event, along with other equipment like the bypass valves on the

ventilation system and the ventilation dampers.

Also, the design management and control was not effective. There were changes to the ventilation system with the addition of more fans that changed its operations and the performance of the existing system. This includes the dampers. Design management was not effective in maintaining design control and managing the changes.

The management of the safety basis was not effective. The modifications to the design were not effectively assessed in the context of the operational safety of the facility. It also appeared that over time changes were made to the relative importance of various design elements for safety during normal and accident conditions and that these changes affected the defence in-depth approach for the facility and its operation.

The CNSC requires a management system in accordance with *Canadian Standards Association N286*. The standard requires an integrated safety approach to ensure that the effect of changes are assessed across all programs and so adjustments are fully understood

and are made where necessary across the programs to maintain the level of safety across the facility. CNSC staff conduct detailed reviews of licensee management systems and conduct compliance verification activities to ensure its effectiveness.

Further, there was an ineffective radiation protection program in place and those working at the WIPP site did not fully understand and characterize the event or control the radiological hazard. The operator of the facility seemed to quickly dismiss the alarm once notified of its malfunction and there appeared to be no further investigation. There was a lack of other available working monitors underground. The technical staff replacing the filter on the monitor did not quickly alert others of this observation of the discoloration so workers could be protected during the shift change.

CNSC requires that radiation protection programs include controls for radiological hazards and worker dose, that the program apply ALARA as low as reasonably achievable, and assess performance through monitoring, including training and worker

qualifications.

Continuing with the contaminant release event, the investigation board discovered that some of the issues and concerns associated with the event were longstanding and repetitive in nature, and there had been a failure to correctly identify problems. The problem with the lack of implementation of corrective actions by contractors was pervasive and so the management of contractors and contractor operations was clearly not effective.

The CNSC requires a management system in accordance with the Canadian standard that provides for adequate contractor management and oversight of contractors and contractor operations. The standard requires the establishment of performance requirements, continual improvement and oversight that includes audits, witnessing and surveillance, independent assessment of contractors, and that contractors are themselves required to conduct assessments.

There was also an unhealthy safety culture. The investigation board identified there was a lack of questioning attitude by workers, a reluctance to bring up and

document issues, and general acceptance and normalization of degraded or non-functioning equipment by staff.

The CNSC requires that safety be paramount in the working environment at nuclear facilities to encourage workers to challenge assumptions, investigate anomalies, consider the consequences of situations or conditions, and to take action.

The *Canadian Standard N286*, includes the recognition and promotion of safety, requires the integration and maintenance of safety in all activities, and requires the clearly identified accountability of management and staff. The CNSC requirements for safety culture are assessed through reviews of policies and programs, inspections and interviews of staff, and reviews of events and incidents.

The lessons learned are valuable operating experience. The CNSC requires licensees to implement operating experience programs, known as OPEX, to ensure that they become aware of issues or problems experienced by other companies engaged in similar activities worldwide so that they can learn from the

experience of others, avoid common problems and improve their own operations.

The WIPP events have relevant operating experience information for both the construction and operating phases for OPG's DGR.

CNSC staff's review of the events, however, did not identify anything new or different in environmental impacts or consequences. The impacts of fire or release of radionuclides from a package has been considered and conservatively assessed by OPG in their EIS. There were no new or additional control measures or mitigations identified by the WIPP events.

Similar control measures were identified and have been considered by OPG in the EIS and in responses to information requests from the JRP. OPG's responses demonstrate the EIS conservatively assessed the events and that the public is protected by the proposed DGR project.

The OPEX from the WIPP events identified the importance of the management system, development and implementation of programs and procedures, maintenance of the safety case and safety culture. It also highlights the importance of contractor control

and oversight.

CNSC staff have confirmed that OPG and their chief contractor, the NWMO, have management systems that meet the requirements of CSA N286. OPG has the contractor management and oversight, continuing improvement and use of OPEX, plus other tools and practices, that are necessary to maintain a healthy safety culture.

It is also important to identify the differences in the regulatory framework between the U.S. and Canada that are relative to the events at the WIPP facility.

The Department of Energy is the owner and designer of the WIPP facility. DOE is also the operator through their use of contractors. DOE is also the regulator, having established many of the regulations that the WIPP must comply with, so the DOE implements the regulations that they have established and must demonstrate the adequacy of this implementation to themselves. This is potentially problematic because there may be a lack of impartiality and an inability to separate roles.

DOE is the operator and as a regulator must also coordinate and comply with

other regulatory bodies. This can cause problems because of the multi-jurisdictional authorities and difficulties within DOE's organization in understanding which role they are engaged in, i.e. being regulated or the regulator co-operating with another regulator.

This framework can also make the effective oversight and control of contractors more difficult as there may be differences in expectations of the contractor between DOE the regulator and DOE the operator managing their contractor. When problems occur with this type of framework it can lead to ineffective regulation and ineffective operation, and a failure of the overall institution to ensure safety.

In Canada, OPG is the owner and operator of the proposed DGR. If licensed, OPG is responsible for safety and for ensuring that they and their contractors effectively implement the regulations established by federal and provincial governments and for complying with the licences and permits issued for the project and for demonstrating this compliance to the regulatory authorities.

CNSC is the independent regulatory body, with an overall responsibility under the *Nuclear Safety and Control Act* for regulating the nuclear industry to protect workers, the public and the environment. This is accomplished by establishing regulations, establishing other requirements through licenses and conditions, assessing the licensee's compliance with these requirements, and stopping unsafe practices through the issuance of orders or by revoking or amending licences.

The CNSC also recognizes that other regulatory authorities have requirements that must be complied with by licensee and through memoranda of understanding and licence conditions also works to ensure this occurs.

Canada's independent regulatory framework fits well with the guidance published by the IEA for effective regulation of the nuclear industry.

CNSC staff also examined OPG's response to the JRP's request for information on the relevance of the WIPP events. Our review considered CNSC staff's assessment of the events, the related elements that are managed through the

application of Canadian nuclear safety standards that will apply to the DGR facility and its operation, OPG's understanding of the events and their use of operating experience, and identification of opportunities for continual improvements to the project.

CNSC staff are satisfied with OPG's response. For both the fire and release events, OPG identified the key concerns that both events were assessed as credible scenarios in their EIS and related submissions.

OPG confirmed the control and mitigation measures identified in the EIS will provide defence in depth, and minimize the risk of these accidents occurring. OPG identified the importance of having an effective management system and safety culture and outlined the use of these events as operational experience for both the construction phase and later operational phase.

OPG has confirmed they will continue to assess new information on the causes and contributing factors as they become known. OPG indicated they would, when moving forward, incorporate the event information where

appropriate into the detailed design of the ventilation system and in the fire protection system.

The terms of the license require that a comprehensive fire assessment and third party reviews be completed on that fire protection system. This will be verified by CNSC staff.

With respect to the impact of the events on CNSC staff's previous assessments provided in PMD 13-P1.3, the events do not indicate the need to implement changes to the DGR project. The impacts of an accident or malfunction that results in a fire or a release of contaminants has been conservatively assessed and the appropriate control measures and mitigations identified.

CNSC staff remain satisfied that such events, accidents or malfunctions, if they occur, would not likely cause significant adverse effects to workers with the proposed controls and mitigations and no on-site or off-site adverse effects to public and the environment were identified.

Similarly, with respect to

staff's assessment presented in PMD-13-P1.2 on the licence application, CNSC staff are satisfied that OPG has an acceptable management system and other programs, such as contractor oversight, the use of operating experience, and continual improvements. CNSC staff are satisfied with OPG's plans to continue to be informed through their operating experience program of the causes of the WIPP events through all licensing phases. CNSC staff continue to conclude that OPG is qualified and will implement adequate provisions to protect the health and safety of workers, the public and the environment.

This concludes our presentation.

THE CHAIRPERSON: Thank you,
Ms Klassen.

We will now take a 15-minute
break, reconvening at approximately 11:00.

--- Upon recessing at 10:41 a.m. /

Suspension à 10 h 41

--- Upon resuming at 11:00 a.m./

Reprise à 11 h 00

THE CHAIRPERSON: Welcome back

from the break. If I could ask everyone to take their seats please?

We are now going to continue with the presentation by the Ontario Ministry of Labour.

Mr. Plouffe, the floor is yours.

**PRESENTATION BY / PRÉSENTATION PAR:
ONTARIO MINISTRY OF LABOUR**

MR. DOEHLER: Good morning, Madam Chair, Members of the Joint DGR Review Panel, and interested stakeholders.

For the record, my name is Lothar Doehler, I am the Manager of the Ministry of Labour's Radiation Protection Service. And I am joined today by my colleagues, to my far right, Mr. Chris Plouffe, Regional Manager of the construction and mining programs; and to my right, Mr. Glenn Staskus, Acting Provincial Coordinator of the mining program.

My apologies to the committee for the late submission of our presentation. It does have relevance to the primary topic of today to address the incidents at the Waste Isolation

Pilot Plant with specific regulatory requirements under the Mines and Mining Plants Regulations which, if adhered to, will prevent any of the events that occurred at the WIPP facility.

So I will now hand it over to my colleague, Mr. Staskus, thank you.

MR. STASKUS: Good morning.
Glenn Staskus, for the record.

I am here this morning to provide an overview to the panel and to the people in the room this morning on some select requirements that are contained in Regulation 854 for Mines and Mining Plants and to provide the DGR an overview of three specific areas, including fire protection and fire suppression systems required on mobile equipment in underground mines, an overview of mine hoisting plants, shaft sinking regulations and also ventilation requirements for underground mines as well.

Just to review some information that was part of our previous presentation. The Ministry of Labour's vision is to make Ontario's workplaces safe and healthy. We do that in a number of different ways, including inspection of the workplace on a routine basis.

We also develop sector plans that are available to the general public for review at the Safe At Work Ontario website and encourage everybody to have a look at what is available as far as information. It details not only our inspection activities, but also details specific enforcement focuses that we carry out throughout the year.

As part of the mandate for protecting the health and safety of workers, I had mentioned earlier that the sector plan is available. And I would like to reiterate a couple of the areas that we have undertaken over the last number of years in the protection of mines and workers in mines, and that are specific enforcement initiatives dealing with underground ventilation requirements in mines.

We have also had focuses on mobile equipment, the operation and maintenance of mobile equipment. We have also conducted a blitz on specific requirements for hoist plants and the operation of hoist plants. And that is something that will likely continue into the future with the Ministry of Labour as part of our Safe At Work Ontario strategy.

The responsibility under provincial jurisdiction is part of the topic today and it will include the whole lifecycle of the project, including the site preparation, the construction, the operation, and decommissioning.

There is also requirement to ensure that there is notification to the Ministry of Labour under Regulation 213 for construction project and as well in the mining program for the operation of a test drill anywhere in the Province of Ontario so that we are notified and have an understanding of where exploration is being done throughout the province.

There are a number of regulations that are currently under the Ministry of Labour, and we have mentioned some of them before. So Regulation 213 for construction projects, I am going to be focusing on some specific requirements on regulation 854 dealing with the items that I discussed earlier.

Regulation 854 sets out specific requirements to ensure that the public is adequately protected. And part of those requirements are fire protection.

In the case of a fire, employers

are required to develop procedures and ensure the procedures for the protection of workers in underground mines and surface mines are available to the Inspection Branch of the Ministry of Labour.

So if an inspector shows up at the property, he has the ability to be able to review the plans and procedures to ensure that they are adequate.

As part of the select requirements for employers, a suitable number of workers must be trained in the firefighting procedures and their names have to be posted on site. And this includes an annual refresher training for all of the firefighting personnel.

In addition, under Section 17 of the Regulations, the Ministry of Labour currently directs Workplace Safety North to look after its mine rescue program and the establishment of the mine rescue stations throughout the Province of Ontario as well.

The owner of a mine, at the owner's expense, must ensure that there is an adequate number of workers that are trained in mine rescue work, and the training facilities are

available and equipped at the owner's expense and under the direction of the supervisor.

Anytime that there is a mine rescue event the Ministry of Labour is notified and we have the ability to go out and review the situation and ensure that it was properly handled.

In regards to underground mines, a mine must have an effective alarm system in place to warn workers in the underground environment, and this system must be tested on each work shift. So if there is a shift work operation, each working shift of the mine must have a test of their fire procedures to ensure that they are adequate and they are working properly.

A report of each of the tests is also required to be kept on file for a period of three years. And if the procedures include the use of safety stations, refuge stations, as was mentioned earlier in some of the other presentations. the refuge stations must be sized to accommodate the workers working in the area, sealable to prevent gasses from entering and have air and water supply and also allow for

communication to surface so that there is direct communication between the workers and the people that could become trapped in an underground emergency situation.

In addition to the fire procedures, equipment in underground mines must also be provided, and especially at key installations or hazardous areas such as electrical stations, substations, transformers, power racks, shaft levels which are typically where, you know, workers congregate during and between shifts.

In addition fire suppression systems which are typically dry chemical initiation systems, are required on all equipment that contains more than 100 litres of flammable oil. So most large underground mining equipment requires a fire suppression system, along with a handheld fire extinguisher as well.

Motor vehicles in underground mines must be maintained and they must be maintained in accordance to the procedures developed by the employer. They must include testing, the maintenance, the inspection of vehicles to ensure that they are in safe working

condition.

Routine schedules for motor vehicle maintenance must take into consideration manufacturer suggested use, and any considerations that they have for the maintenance of the equipment as well.

Gasoline, propane or other volatile fuel cannot be used underground.

In addition to protection of equipment and the atmosphere underground, there are also precautions that have to be undertaken if there is hot work being done in the mine, including welding or cutting, burning torches. They all require written procedures for the safe use.

And only workers that have been trained and that are competent or under the direction of a competent person shall use hot work equipment. And there also has to be fire extinguishing equipment on the site as well.

A re-examination of the work area has to be completed within two hours to ensure that there is no residual elements of the work that was undertaken and no residual hazards to the workers as well.

So workers must also be protected by the fumes through the use of ventilation or personal protection equipment as well.

Procedures are also required for both surface and underground operations to respond to fires and other emergencies. Workers require training.

And equipment must be available to provide an adequate response, and that is based on the size of the operation. Every operation is different, mines are all different in Ontario. So they have to be suitable to the size and operation of the mine.

All the equipment underground must be maintained for safe operation, protected in the event of a fire, taking into consideration the manufacturer's recommendations.

Garages, storage areas and other key locations require a fire suppression system as well as fire doors that are maintained and checked in accordance with the regulatory requirements set out in Regulation 854.

There are comprehensive requirements for both training for the workers, ensuring that the equipment underground is

maintained according to the manufacturer's suggested usage, and maintained according to the procedures developed by the employer as well.

The next part will be an overview of mine hoisting plants.

Currently in the Province of Ontario there is about 40 underground operating mines. This varies from year to year as mines open and close. Typically mines and the life of mines is dependant on the orabody. Mines are typically developed in the same manner or same fashion.

And in this case I am going to review something that is typical within hard rock mining, and that is the use of a multi-deck stage or a galloway that is used for shaft sinking.

I am going to provide you with a little bit of information on the requirements around hoisting plants, the application of a galloway, as well as some of the maintenance requirements required during shaft sinking and exploration.

It is important to mention that no mine hoisting plant shall be operated without a written statement by a professional engineer

identifying the location of a hoist plant. The maximum load that can be carried, including materials and persons, and that competent people must examine the mechanical parts of the hoist plant at routine intervals for testing and maintenance.

During a typical development of a mine shaft a conveyance is required once the vertical depth below surface exceeds 50 metres. And this is typically achieved through, as I mentioned earlier, a mining galloway, which is a multi-stage platform. As the depth of the mine increases, the platform is continuously lowered into the mine.

It is not something that moves typically up and down the shaft everyday. There are apparatuses within the galloway that allow for men and material to be transported from surface to underground, and the waste rock to be removed after the cycle of blasting is completed.

So according to the Regulations for mines and mining plants, hoists used for transporting of workers and materials must be kept in safe working condition. And competent persons shall examine the mechanical workings of

the hoist in accordance with the Regulations everyday prior to use.

There is also more thorough examinations that must be conducted weekly. During that more thorough examination they evaluate the braking systems, look at all the key wear aspects within the mining hoisting plant, including the wire rope that holds the attachments in place and suspends the cage or the conveyance and the shaft.

The picture on the right shows a typical galloway being installed into a modern mechanized mine. As you can see by the size, it is a large complex piece of equipment that is used.

In regard to the wire rope that suspends the conveyance in the shaft, it is tested in regards to the CSA standard G4 for the purpose of mine hoisting and mine haulage. So all the ropes must be tested at routine maintenance intervals.

The materials testing lab, which is under the direction of the Ministry of Labour, issues test certificates as a record of the breaking strength of a wire rope sample used for

transporting material. Wire ropes are subject to routine tests. And then a competent person using electromagnetic devices must ensure that the rope is in good condition.

And then the MTL lab retests each rope in operation in Ontario mines at routine intervals, and that test is conducted according to the original breaking strength of the rope. So once it falls below 90 per cent of its original breaking strength the rope must be removed from service.

So just in summary, hoisting plants and shaft sinking equipment are designed and built according to good engineering practice, maintained and tested according to requirements set out in OHSA and the Regulations, and regularly examined by competent persons and kept in safe condition.

Part 4, Regulation 854 deals with ventilation. In a mine or a mining plant a ventilation shall be provided and maintained to provide clean breathable air. Accurate plans and records of the ventilation system at either surface or underground mines must be kept and made available to the Ministry of Labour.

Included in the plans must be the locations of all fans, the volume of air in cubic metres, location and function of fire doors, ventilation in controlled doors so that everybody on site has a good understanding of the direction of the airflow, how much air is available in any particular area of the mine and how the different areas of the mine are segregated by other stoppings, vent doors or other devices to ensure that everybody, including mine rescue personnel when they are dispatched in case of an emergency, have a good understanding of not only which direction the air is moving, but also which way the exhaust and the intake is, and the layout of all the refuge stations that are in the underground environment as well.

In addition, employers are required to maintain a chart of procedures for the use of diesel-powered equipment. So wherever there is diesel-powered equipment operating there has to be an understanding and a chart of procedures that details exactly how much air is flowing in that area, which way the air is flowing.

And it also has to be available

to the operators working in that area so they have a good understanding of which way all of their supplied air is moving and how much air is actually being supplied in the underground environment to ensure that the equipment that they are operating meets the requirements that are set out in legislation.

The employer must test the volumes of the air working in all the underground haulage ways to ensure adequate volumes are available and that the minimum flow rates prescribed by regulations have been achieved. And the information is to be made available to the workers as well.

Equipment is tested on a regular basis for emissions, as described by our regulation, and at routine intervals, as prescribed in consultation with our joint health and safety committees in the Province of Ontario.

And that is the end of the slideshow.

THE CHAIRPERSON: Thank you very much. I will now proceed with questions from the panel for all three presenters.

So perhaps if I could begin with

Dr. Muecke?

MEMBER MUECKE: Thank you.

I would like to start on fire drills.

First of all to OPG, to your knowledge, how frequently were major fire drills held at WIPP?

MS SWAMI: Laurie Swami, for the record.

I don't think that we have that information readily available. We can check through the DOE report that was file and perhaps we could come back with that information?

MEMBER MUECKE: Maybe, I can ask the same question to CNSC?

DR. THOMPSON: Patsy Thompson, for the record.

Unfortunately, you will get the same response. We don't have that information.

MEMBER MUECKE: Okay, thank you.

Now, have you heard that OPG and the Western Waste Management Facility holds major fire drills once every two years? Is that correct?

MS MORTON: Lise Morton, for the

record.

No, fire drills are held at least annually. What occurs every two years is an independent third-party code compliance review.

MEMBER MUECKE: Okay, thank you for that clarification.

Are the plans for the proposed DGR in terms of fire drills equivalent to what we see at the Western Waste Management Facility?

MR. WILSON: Derek Wilson, for the record.

Yes, they are. The current emergency response plan has annual drills for each of the incidents that we expect to have on the facility, and that will continue into the site preparation and construction phase.

MEMBER MUECKE: Now, during construction and operation of the proposed DGR the dynamics of the system are constantly changing; you are changing room sizes, you are building shafts. Do you consider an annual fire drill adequate enough to take those continuous changes that occur into account?

MR. WILSON: Derek Wilson, for the record.

I will speak to the site preparation and construction phase and then I will pass it over to Lise Morton for the operational considerations.

The design, as you say, is dynamic, there are various activities; we are going to be transferring from surface construction activities into shaft sinking activities and into lateral development.

We say a minimum of annually, but there is the potential where, specifically in our training of individuals as we go from stages and go through different facilities, that we would increase the number of drills. But again, it would be dependant. We would expect that as we transition from surface into shaft sinking that we would have a series of activities around that change of activity.

And once we get into lateral development it becomes static in its entirety for about a four-year period, so we may find that annual at that time is sufficient.

MEMBER MUECKE: But this is not formalized at this stage and it is something that is going to evolve as the project evolves?

MR. WILSON: Derek Wilson, for the record.

We formally have in our health and safety management plans the requirements to have: 1) the annual drills for the activities that are being undertaken; but 2) to identify new risks as they come into the activities plan for work to be assessed, and then for those plans to reconsider the need for additional drills. So that exists today.

MEMBER MUECKE: I would like to, on the same theme, address the Ministry of Labour. In terms of fire drills, you have the regulations and major fire drills have to take place once a year.

Are your inspectors present at that time?

MR. STASKUS: During a fire drill, if there is a mine rescue team called out, we will get a report of that occurrence through the requirement to report.

In addition to the yearly test -- the actual requirement is a yearly test for each working shift. So if it is a continuous operation that is going to be 24 hours in

duration, depending on the shift length, there might be a requirement for as many as four tests in a year if it is an eight-hour schedule. A 12-hour schedule may require, you know, amendment ensuring that every working shift has a test of their fire drill.

MEMBER MUECKE: So just to make sure we understand this correctly. You will review reports, but you will not send out inspectors unless you see problems. Is that correct?

MR. STASKUS: That is correct.

MEMBER MUECKE: I would like to switch over now again to OPG and maybe bring up slide 14, if it's possible.

Regarding the WIPP incident, gas pressure is suspected to have been a contributing factor to the breach of one or more of the containers at the WIPP site. Containers intended for the proposed DGR are vented we understand.

My first question is: Is this the case for all containers?

Second, what are the chances of a venting valve becoming blocked? What would be the consequences if this occurred before the

placement of closure walls?

MS MORTON: Lise Morton, for the record.

So first for clarification, I believe your first question, no, not all containers are vented. For example, some of the low-level waste containers are quite simple steel boxes with welded seams, et cetera. So some of them may not have a vent valve, so I think that's important to note.

I'm going to defer as well to Paul Gierszewski who can perhaps provide some additional clarification, because I believe your second question again was around the venting valve becoming blocked. So again, keeping in mind there are quite a few of the low-level waste containers that are going to be going in the DGR that won't have a venting valve.

I'm sorry, Paul can perhaps provide more information on any containers that might have venting valves. I'm trying to go by memory here.

DR. GIERSZEWSKI: Paul Gierszewski, for the record.

So the requirements are that the

containers have to be vented if there is a risk -- if the nature of the waste in those containers is that they could generate gas. It doesn't specify exactly how they've done.

As Lise was saying, a number of the containers are basically just strapped lid so they are not tightly sealed. I think the ones where a deliberate venting is required or would be included is in the ion exchange resins and then you get into the retube containers, they are not expected to generate gas, they are sealed containers. So that's the design basis of the containers.

MEMBER MUECKE: That brings me back about the failure of valves.

--- Off microphone

MS SWAMI: Laurie Swami, for the record. We are just going to take a moment to confer on your question.

MEMBER MUECKE: In that case, I pass on to one of my colleagues.

THE CHAIRPERSON: Are you ready to respond? Thank you.

MS MORTON: Lise Morton, yes. I'm sorry for the confusion, we are just

confirming.

So the IX resin column, as Dr. Gierszewski referred to, again, we don't really have a waste package that has a venting valve-type configuration, which is causing a bit of our confusion. In terms of a concern therefore of the venting mechanism or path involved in those containers being blocked, again, we haven't seen any evidence of that. And in the case of resin liners, you know, they are going to be down in the in-ground containers for quite some period of time before they have been transferred to the DGR. I believe if any of that mechanism would have occurred, it would have occurred long before we transferred to the DGR and we certainly again have not seen anything like that. But we don't really have a venting valve mechanism.

Again, possibly Dr. Gierszewski can add to that.

DR. GIERSZEWSKI: I would confirm that the intent would be that they would be vented, but not necessarily by putting in a venting valve to maintain that.

As an example, OPG moved a number

of the in-ground resin containers in a program a few years ago and as part of holes were drilled into each of the containers to ensure they were vented before they were moved and we would similarly require or expect that there would have to be some venting of these containers prior to moving them to the DGR.

THE CHAIRPERSON: Thank you.

With respect to the earlier question where we didn't quite have the answer in terms of the number of fire drills, if you can just get back to us by the end of the day with the answer to that. I'm not going to make it all a formal undertaking or anything, but if you could. And if you can't we understand. We know that there is a lot going on and it may not always be readily available.

I would now ask Dr. Archibald for some of his questions.

MEMBER ARCHIBALD: Thank you.

This is addressed to OPG and then probably to MOL afterwards.

In Ontario mine underground workers are required to report to the nearest available refuge station upon being informed by

way of various communication strategies of incidents such as underground mine fires without exception. Is that my understanding from MOL?

MR. STASKUS: Glenn Staskus, for the record.

Yes, it would be for underground fires.

MEMBER ARCHIBALD: Okay. And only after site review and permitting by mine rescue personnel would workers then be permitted to leave refuge stations. Is that also true?

MR. STASKUS: The extraction of the workers from the refuge station would be under the supervision of the mine and would be in consultation with mine rescue organizations, all the mine rescue workers as well in consultation with.

MEMBER ARCHIBALD: Then my question to both OPG and MOL is: To your knowledge, were similar field safety procedures in existence at the WIPP site or were workers permitted by their fire protection program only to exit the facility in by travelling to the various shaft sites once being informed of an accident such as a vehicle fire?

To OPG first.

MR. WILSON: Derek Wilson, for the record.

When we had the opportunity to meet with the individuals from WIPP we asked the same question and they didn't have the same requirement for all of the underground shaft to report to a refuge station as we do in the Ontario regulation requirements.

Their approach was to provide the closest and quickest escape from the facility, which was the waste hoist. So they didn't have a similar requirement to essentially shelter in place within the refuge station, have accountability to all individuals through that process. Then again, as the Ministry of Labour has pointed out, then have a process from which they are extracted from the site once it has been determined to be safe to do so. So they took an approach of an immediate removal of individuals from the site through the waste hoist.

MEMBER ARCHIBALD: To the Ministry of Labour, is that also your understanding?

MR. STASKUS: Glenn Staskus, for

the record.

That would be our understanding as well.

MEMBER ARCHIBALD: Thank you.

This is to OPG. On page 7 of your EIS submission -- this is not on the basis of the presentation today -- you stated that:

"The site Safety Culture and lack of a questioning attitude, reluctance to report issues to management, and an acceptance of degraded equipment and conditions;..."

exists.

Does OPG's emergency, fire safety, maintenance or other management plans, collectively known as the safety culture, have provisions to receive input from workers and staff without disincentive or stigmatization potential?

MS SWAMI: Laurie Swami, for the record.

Our safety culture is very important at OPG and we have a very robust program for seeking input from our employees. We

have a station condition record system where employees are encouraged to do file reports so that management is aware of issues with regard to any of our programs, including fire protection and emergency response.

So it's something that we value very much and we can give you specific examples if that's helpful.

MEMBER ARCHIBALD: That would be fine, thank you. Say that

I have one other question at this point on this particular one. I'm going to be bouncing to MOL and CNSC shortly.

Does OPG have any plan to use filtration in order to remove radionuclide dusts and other types of aerosols from the exhaust air? It had been reported in previous submissions that tritium is a major component of the exhaust air and does not need filtration, but in view of the fact that we now have a vehicle fire, soot and other aerosols being released, would filtration be part of OPG's future plans for exhaust air treatment?

MR. WILSON: Derek Wilson for the record.

I will provide a bit of a response to this and then I will ask Dr. Gierszewski to provide additional with respect to the safety analysis that has been performed.

Our current design is, as you state, without filtration. We have considered both fire and radiological release in that. We have considered the design of the ventilation system such that we have the exhausts moving away from individuals, as well as the surface release of the ventilation system being ducted away from the active activities on the site and given those we feel that we are adequately addressing worker safety in the areas that they are going to be exposed.

Then perhaps Dr. Gierszewski can provide a response related to the safety analysis itself.

DR. GIERSZEWSKI: Paul Gierszewski, for the record.

So we get the safety assessment and we did not assume in that assessment that there were filters in there.

The results, four accidents and we went through and the types of events that were

seen at WIPP were well below criteria. I think this relates in part to the nature of the wastes. Again, we aren't handling weapons-related materials, this is low and intermediate level waste from CANDU reactor operations.

I would also point out that our more active intermediate level wastes are in very robust containers. In the course of the discussion with the Panel there were two information requests, 04-135 and 09-402, that the Panel did ask: Well, what if you included HEPA filters, what would the effect of that be on it and so those results were published. They made a small difference, or in many cases they made almost no difference, in some cases they did result in a small reduction and the radiological release remained well below criteria. In the first place they reduce it somewhat and again that related to the fact that in our waste streams the dominant contributors tend to be the volatile species, tritium and carbon-14, and they wouldn't be impacted by HEPA filter system.

MEMBER ARCHIBALD: Thank you.

I would like to address part of the same question to CNSC.

Would you consider the use of HEPA filters plus tritium removal processes as part of an exhaust remediation process? And what could be done to remove tritium from the air?

DR. THOMPSON: Patsy Thompson for the record.

We did assess the use of HEPA filters in the same manner as OPG has just explained, looking at the radiological species that would be released and various types of scenarios.

Given that it's tritium and C-14, HEPA filters would not bring -- essentially do not remove those types of gaseous species from the airflow.

We found that HEPA filters could make a difference for some of the non-radiological particulates, but not to an extent where -- it wasn't a particular health and safety problem to start with.

In terms of removal of tritium from gaseous emissions, the levels are so low that to my knowledge there isn't a technology that would effectively remove such low levels of tritium in air essentially.

MEMBER ARCHIBALD: This is back to OPG and going back to the relevance of both of the events that occurred.

From your slide No. 7 you noted that the credible underground fire event studied -- assessed communication notification system needs.

How would the proposed DGR system differ in any substantial way from the management of the WIPP safety communications system that was operating? What major difference exists between what OPG is proposing and what currently exists or did exist at WIPP?

MR. WILSON: Derek Wilson, for the record.

I think the main difference between the two events and how we plan to respond to those types of events versus how the WIPP experience unfolded on that day, very similar systems in terms of communication, very similar in terms of the mine phone system, the notification system, the central communication centre, and so on, we are going to use stench gas systems in our system that would be released upon notification of the fire alarm, which is

different.

But I think it comes down to the processes that were used and the way that it was communicated at WIPP. Very similar systems, they just chose to do it in a different way than we would do it in our particular case. We would still use mine phones, but those mine phones would be used more from an accountability perspective and making sure that people are accounted for.

The mine stench system is the primary. We also have leaky feeder systems planned to be able to communicate throughout. Each individual will have access to that communication.

So the technologies are very similar, it was just the approach that would be taken that I think is the primary difference between the two.

So the technology would be very similar in terms of modern technology. The stench gas is an old-time system, but it is a primary and very effective and I guess it's just the manner in which the communication system is used.

MEMBER ARCHIBALD: All right, then.

A major consequence of the WIPP fire event was smoke inhalation exposure of employees who were told to evacuate to the nearest shaft -- to the exhaust shaft obviously.

With relevance to the proposed DGR, how would use of the refuge stations provide enhanced fire protection?

MR. WILSON: Derek Wilson, for the record.

Well, there are a couple of things. One is, the ventilation flow is critical in the immediate response to a fire event, i.e. you don't change the ventilation flow because people are expecting to know where the clean air is coming and where there is poor ventilation.

In discussion with individuals from WIPP, some of the smoke inhalation was the result of individuals not having practice, the donning of self-rescuers, as well as having brand-new equipment in front of them. So when they went to use it -- you know, they trained, and they all had training and they all had training records of being able to don their

self-rescuers, they used the ones that were in training rooms that had been used 100 times and you open them, they fall apart. So that was one of the lessons that they have, was that individuals, although they knew how to do it actually couldn't use a brand new self-rescuer.

So we are considering the use of self-rescue equipment as well, self-donned ventilators and so on, in our overall fire hazard assessment.

But the use of the refuge stations and the placement of those refuge stations and for the ability for an individual to get to those within a short timeframe I think would provide a safer refuge as which is why it has been adopted by Ministry of Labour in Ontario as the best practice.

So I believe that would take people out of harm's way in a quicker means and for the most part wouldn't put them into a situation where they would have to travel through the smoke, because again they would be in a position such that they should always be in the upstream side of the fire.

MEMBER ARCHIBALD: Thank you for

the response.

Just to be clear, it is because the use of the refuge stations, and so on, is a primary aid in case of accidents and fire events, and so on. Self-rescuers are not normally used in Canadian mines simply because that is a secondary method of rescue.

To MOL, is that also your opinion?

MR. STASKUS: The use of adequate procedures to ensure worker safety is a requirement. Refuge stations are also available to stakeholders and use in case of an emergency as a way of protecting the workers in the underground environment.

MEMBER ARCHIBALD: Now, to OPG from slide 9, it was mentioned that:

"Once radioactive contamination was noted by surface monitors, a shelter-in-place strategy was initiated to protect surface workers." (As read)

In the event that any workers had been present underground during this emergency --

which was not the case, but should workers have been underground during the radiologic release, would the only protective measure available have been to reach the shafts and deploy to surface as for the fire event?

MR. WILSON: Derek Wilson, for the record.

I'm not in a position to speak to the detail of an evacuation plan at the WIPP facility in a radiological event, because again there were no workers underground at the time of the event so we don't have that level of detail in front of us.

However, we did ask the question had there been an active workforce there, in that particular case they use a very similar approach to that of our own, which is keeping the workers to the fresh air side and so therefore they didn't anticipate that there would have been workers downstream of the radiological event in the ventilation flow if there had been workers there at the time.

MEMBER ARCHIBALD: Then my next question would have been: What would be the significant action differences to be taken by

underground workers at a proposed DGR in WIPP be?
So I guess you cannot answer that.

MR. WILSON: Derek Wilson, for
the record.

That is correct.

--- Pause

THE CHAIRPERSON: Dr. Muecke, do
you have some more questions?

MEMBER MUECKE: Yes, indeed.

I would like to address legacy
waste or what you call historical waste.

Some of the containers that are
to be placed in the proposed DGR are decades old
and come from various sources. How does OPG
ensure that the proposed waste criteria have
always been met?

I note in your presentation today
that you mentioned a long history of monitoring
stored waste. Does "long" mean the entire
history of the waste?

I also note that you mentioned a
visual inspection of a large volume, what
constitutes a large volume in this case?

MS MORTON: Lise Morton, for the
record. I will try to ensure I cover all of your

questions.

So the first part of your question related to the fact that a lot of our waste and our containers are decades old, as you point out, and then how do we propose that the Waste Acceptance Criteria has always been met; is that correct?

So with respect to that, again -- and I will refer to this probably a couple of times.

First of all, fundamentally the Waste Acceptance Criteria, as I said, is a contract, if you will, between the waste generators and the waste facility. We have the advantage, if you will, in the sense that because it's all one company we can work collectively and certainly collaboratively with our waste generating station partners and we do that. For a long time now the waste facility has had ongoing dialogue and working relationships and quarterly stakeholder meetings, as an example, with the stations to ensure compliance with the Waste Acceptance Criteria.

We have also had a role, what we call a Waste Acceptor Coordinator, and we have

had that position for at least 20 years that I'm aware of, again to work with the stations on Waste Acceptance Criteria and the requirements of that document.

The other way that we have some confirmation that the Waste Acceptance Criteria has been met, especially on these older legacy wastes, and it ties to your other question in terms of visual inspections of large volumes of waste.

So dating back as far as -- I have at least found records into the mid to late '90s and there are probably some even prior to that, we had several campaigns where we have gone in, and especially in what we call non-processable wastes, which is waste that we haven't incinerated or compacted, we have opened up those waste packages in some cases, because in one instance we were trying to gain space efficiency in the buildings, so we have inspected quite a bit of volume of actually packaged waste and never found any instances of non-compliance with the Waste Acceptance Criteria.

When I also referenced large volumes of containers having been inspected, a

recent example is in 2006. We relocated the waste in seven of our low-level storage buildings -- and each low-level storage building roughly contains 5,000 to 6,000 cubic metres of waste, so that's a significant volume of waste packages that we physically relocated -- because we were installing an upgraded fire detection system and we needed to relocate the waste. So in having moved all of that waste around we saw no evidence of chemical reactions.

I think that addressed all of your questions, unless I missed something.

MEMBER MUECKE: Just one clarification then. Thank you for that.

The Waste Acceptance Criteria, are they dynamic? They have evolved with time, how does that impact upon your evaluation of legacy waste, because you have had -- have your regulations changed and how much have they changed?

MS MORTON: Lise Morton, for the record.

Yes, the Waste Acceptance Criteria is a dynamic, active document. It undergoes review at a frequency of at least every

two years. But if conditions arise that cause it to be reviewed and revised more frequently that can certainly occur.

It has evolved with time more from the perspective of as we work with our waste generators and either new technologies or, you know, we find better ways to perhaps package things, we will incorporate that into Waste Acceptance Criteria.

The second part of your question in terms of how does that impact legacy waste, I'd have to give it further thought in terms of whether there was anything specifically that would impact that, but nothing is coming to the top of my mind. Because the types of revisions that you'll see to the Waste Acceptance Criteria are not generally getting down to the fundamentals of the radiological characteristics or the chemical characteristics. We haven't seen a lot of changes to the Waste Acceptance Criteria in that fashion.

It's going to get around perhaps packaging. I can think of changes like double banding lids to improve sealing, things like that.

And then in terms of regulation changes, I believe -- which was another part of your question -- it's not typically regulation change that -- and I can't think of an instance of regulation change that has directed a revision to our Waste Acceptance Criteria. It typically has more to do with practices.

I will give you one example of something that has changed recently in the Waste Acceptance Criteria. We are scrutinizing more things like scrap metal and small volumes of bulk metal that come to us to see if there is other opportunities to further process that waste, as an example. So that's an example of how technology changes and you try to evolve with it.

MEMBER MUECKE: Maybe to continue on that line to CNSC, what is the input of CNSC into the Waste Acceptance Criteria that are set out in the packaging?

MS THOMPSON: Patsy Thompson, for the record.

I'll just provide a little bit of information and then I'll ask Kay Klassen to speak to the work that CNSC does in terms of oversight of the waste management practices of

OPG and other licensees.

In terms of your question with the changes over time in terms of the Waste Acceptance Criteria or expectations of the CNSC, a number of years ago the practices evolved in relation with the Radiation Protection Program and the Waste Management Program to encourage and incorporate practices to minimize the creation of waste.

There were a lot of programs where before material was brought into a station, for example, over packaging and things like that were removed so that it wasn't brought in and then created low-level radioactive waste. So a number of practices were put in place to minimize the amount of waste they introduced, and also some of the recycling and reuse programs that have just been discussed.

In terms of the definitions of radioactive waste there has been a lot of work at the IAEA and in Canada, and I'll ask Ms Klassen to speak to those.

MS KLASSEN: Kay Klassen, for the record.

We'd like to point out that where

the wastes are being generated are at the nuclear reactors themselves. CNSC has staff permanently located at those sites who conduct reviews and inspections on a daily basis. That would include areas where wastes are being generated or areas where wastes are being stored, the systems that are producing wastes such as resins and filters.

So that through OPG's operations system which develops relatively limited streams of waste, those streams would have changed somewhat over time but not in a great deal. It would be -- the changes would be related to new activities at the nuclear plants themselves such as refurbishment activities. So those would be the drivers, some of the drivers in the context of changes to Waste Acceptance Criteria at the Western Waste Management Facility.

So staff is -- CNSC staff is present, is aware of those development of waste streams, does conduct inspections, is aware of the activities in relation to the processing of those materials and then the material then would be shipped to Western where, again, CNSC staff conducts reviews and inspections of the Western Facility.

So we also have, in the context over the years of operation, participated at a number of international development of guidance and standards from the IAEA. We, CNSC, has participated in the development of other Canadian standards for waste in the context of the Canadian Standards Association. Those have become incorporated in our licensing requirements as well and we see that trickle down into the operations and how OPG conducts their activities.

That's the waste minimization, the reduction and recycling of some materials that they may be able to decontaminate and reuse within their radiation -- pardon me -- within their Zone 2 or 3 areas where the expectation is some of the equipment can continue to be used in a very controlled manner prior to being decided that its some waste to be disposed of.

I beg your pardon. Have I missed it?

MEMBER MUECKE: Thank you very much.

But if the Chair allows me one more question and perhaps a naïve one, are there lists of compound materials that must never be

packaged in the same package? Are there like exclusion lists in order to prevent any possible interaction among waste components?

MS MORTON: Lise Morton, for the record.

The Waste Acceptance Criteria does certainly have a section very much -- very explicit in terms of unacceptable waste; liquids, reactive waste, PCB waste, et cetera.

With respect to the packaging of waste and, again, this is most relevant I would think with respect to low-level waste because it can be more of a mixed type waste, if you will, beyond that the Waste Acceptance Criteria also defines what constitutes -- we have three individual low-level waste streams, incinerable waste, compactible or non-processable. So the Waste Acceptance Criteria is quite prescriptive in terms of what constitutes incinerable versus compactible versus non-processable waste. That information usually translates as well into posters at the stations.

I'm just going to defer to Dr. Gierszewski with respect to intermediate-level waste. The Waste Acceptance Criteria doesn't

specifically get into again those wastes being co-mingled, I think is what you're asking, with other wastes. But again, keeping in mind that those wastes come from closed loop station systems such as resin tanks, so it would be quite difficult to do co-mingling.

The only other thing I'll mention is that with respect to the use of absorbents which is believed to have been a factor in the WIPP release event, we have a separate reference document as part of the Waste Acceptance Criteria that's very specific on those absorbents which are acceptable to be used in conjunction with our wastes. And we monitor the stations to ensure that those are the absorbents and the only absorbents that they are using.

I'll turn it to Dr. Gierszewski in case he can add anything to the discussion.

DR. GIERSZEWSKI: Paul Gierszewski, for the record.

So as Lise Morton was saying, we have a number of defined, reasonably well-defined waste streams. The Waste Acceptance Criteria defines categories that are excluded and makes reference to *Ontario Environment Protection*

Regulations for those, such as chemically reactive waste.

But there's not a -- there's not a specific list in the Waste Acceptance Criteria of specific "these are not accepted". Chemically reactive are not accepted and there is a generic definition for that. Ignitable waste is identified as a class of waste again. There is a generic definition for that.

So then one looks at the individual waste streams to see where they would meet or compare against those requirements to ensure that we have no chemically reactive waste because they are relatively well defined and continuous waste streams. We have done that. And certainly, as one of the -- and the safety assessments are taken to account for the characteristics of the waste in that.

Part of our review of the WIPP incident, we did go back and we did look at a very specific list of things that one could consider as potentially reactive-type materials and just go through the exercises saying, you know, let's just make sure none of these are in our standard waste streams as an exercise.

I could pass perhaps -- I don't know whether Dr. Dave Evans behind you would have any additional comments on some of the chemistry aspects of the waste.

DR. EVANS: Dave Evans, for the record.

Yeah, I would just support Paul's point about these wastes being from predictable processes. The resin wastes come out of systems that have changed little since the start of the CANDU industry. They are slurried into spent resin storage tanks at the station and then eventually into spent resin liners and stored at the Western Waste Management Facility in the engineered IC-12s or IC-18s.

So this is a well-established, pardon me, type of waste stream and we have a high degree of confidence. We understand what goes into that. There's essentially no opportunity for other materials to enter a stream like the spent resin stream which is one of our larger ILW processes.

Again, it's a well understood, long-established process.

MEMBER MUECKE: Thank you.

THE CHAIRPERSON: Dr.

Archibald...?

MEMBER ARCHIBALD: I'd like to go back to the WIPP event and address this to CNSC, from whom a detailed response was provided in their written presentation.

In your summary review of the WIPP fire event you stated that two service workers attempted to travel to the site and put out the fire unsuccessfully. This was about 10 minutes after the event initiated.

To the knowledge of CNSC, do you know if a safety infraction would have occurred by this action?

MS KLASSEN: Kay Klassen, for the record.

I'm aware from what's written in the report -- again, I'm not fully cognizant of the regulatory regime through the state's mining group that is involved with occupational health and safety at the site but that wasn't part of procedures. It wasn't the accepted procedural response to the fire.

And I know that the staff that did go there did take expected equipment.

Somebody did have a monitor for carbon monoxide along with the fire equipment but the response wouldn't be something that would be expected by the CNSC in a uranium mine. It would be tailored. It wouldn't be spur of the moment. There would be a very established response for a fire response.

MEMBER ARCHIBALD: Thank you.

And then I'd like to redirect this to Ministry of Labour and OPG. Would you care to comment on this response activity and its appropriateness for underground mine emergency response within Ontario?

MR. STASKUS: Glen Staskus, for the record.

I'd just like to reiterate that mine rescue activities at a mine are under the supervision and the procedures developed by the mine and the supervision of the mine. Mines are -- although complex workplaces, they are well established within the province.

We have been mining in Ontario for an awfully long time. I think the safety record of the mines also dictates that the procedures are, you know, well followed and in

place and in the workplaces in Ontario.

MEMBER ARCHIBALD: And to OPG...?

MR. WILSON: Derek Wilson, for the record.

My understanding of the incident as you describe it, Dr. Archibald, is there were a couple of workers who observed the circumstances that were underway. There was a chemical, about a 300-pound chemical fire suppression equipment that they were trying to mobilize to the site and at the time, as the CNSC have pointed out, their carbon monoxide indicators went off and they abandoned that activity and retreated back to -- for the evacuation. However, it's not a -- it would not be a standard protocol for a response to a fire.

Obviously, if there is a fire you try to extinguish it if you can do so safely. Otherwise, then you retreat to use the proper mine -- the proper evacuation techniques, as we've described previously.

MEMBER ARCHIBALD: Thank you very much.

And just to continue in that same vein, and this is about the Facility Shift

Manager -- at a time approximately 30 minutes after the start of the fire and evacuation noticed the FSM, as he's called, activated the local mine rescue team.

To the Ministry of Labour, would you be able to explain whether this 30-minute delay in activating emergency response is appropriate?

MR. STASKUS: Glen Staskus, for the record.

As I indicated earlier, the mine rescue procedures are underneath the supervision of the person in charge of the mine. So it would be up to that procedure to dictate what the protocol would be for notification of the mine rescue team.

MEMBER ARCHIBALD: So there is no set time period in Ontario mines by which activation must occur or alerting the mine rescue team if notice is given of an event or an emergency?

MR. STASKUS: Glen Staskus, for the record.

Just to clarify, there is a requirement to notify the use of a mine rescue

team. There's no time factor involved with that.

MEMBER ARCHIBALD: Thank you very much.

And one other input from CNSC, in the inside section of their written report, CNSC has suggested that:

"OPG must apply lessons learned from the WIPP fire event actions to minimize hazard occurrences." (As read)

And they have listed a series of features. And thank you very much for the detail, items such as minimize vehicle fires acceptability, negate the effects of poor central monitoring room operations, updating effective emergency response plans.

And my question to OPG is, does OPG concur with these lessons learned and propose procedural changes if not already planned?

MS SWAMI: Laurie Swami, for the record.

Could you just give us the page reference if you wouldn't mind?

MEMBER ARCHIBALD: This would be

in the written CNSC response under the subheading called "Insights". I do not have the page marked unfortunately.

This would also be under PMD 13-P1.2 for CNSC recommendations.

--- Pause

MS SWAMI: Laurie Swami, for the record. Sorry.

I'm looking through the report and I see sections that are referenced "Impact". I see sections referenced "Recommendations". I'm just trying to find -- because I think you had some very specific words that I'd like to just make sure we're giving you the right information.

MEMBER ARCHIBALD: We'll just keep it general.

The general question was, do you concur with the lessons learned or the features for the request by the Panel for lessons learned from the WIPP incident and if any procedural changes have been noted in the documents submitted would you be planning to utilize them if not already planned?

MS SWAMI: Laurie Swami, for the record.

I am presuming that the CNSC has provided us good input here. However, it's difficult when I can't see precisely the words. So you know, I'd like to say yes because I think that's likely the answer. I'd just like to see the words if that's possible.

THE CHAIRPERSON: Ms Swami, if I perhaps could weigh in here with some of the precise words which I also made note of, and I believe it's -- actually originally in both your written submission and the CNSC are very similar words.

So the words are things like: considering changes in design and processes such as minimization of use of combustibles, fire detection, fire suppression, communication, the location of portable refuge stations or emergency response.

So Dr. Archibald is asking you in under those categories, did the WIPP incident lead OPG to consider specific changes in those categories?

DR. THOMPSON: Perhaps, and Dr. Swanson, it's page 61 of the staff's CMD.

THE CHAIRPERSON: Thank you, Dr.

Thompson.

--- Pause

MS SWAMI: Laurie Swami, for the record.

So yes, we would consider these, as I suspected I would say yes to this question. I just wanted to make sure I was reading the words correctly.

So yes, we would agree with this. Of course, whenever we look at an event that takes place at another facility we would go through a very similar process to this, identifying all of the different areas that we would want to make sure we had addressed as part of our own learnings from these types of an event. It's very important to OPG that we are always learning from industry events.

MEMBER ARCHIBALD: Thank you very much.

I'd like to address questions to CNSC now from the same written document.

Mention is made in your written submission that the underground air monitor was disabled due to malfunction. And this apparently occurred 29 minutes after the radiologic event

started.

My question to CNSC is, do you have any knowledge of the cause of the malfunction and why in the singular case where radiologic contamination release was identified at the WIPP, the continuous air monitor did not operate for any more than 29 minutes after it initiated an alarm signal?

Is this a common occurrence in underground uranium mines or other sites to have equipment fail?

MS KLASSEN: Kay Klassen speaking, for the record.

From the report it was identified that there were other non-functioning air monitors underground that had not been repaired. The one that malfunctioned was quickly dismissed by the operator.

Our expectations in the context of equipment located in any area is that they should be fit for service. The kind of malfunction 27 minutes after it initially alarmed would not be expected to happen. Certainly, equipment can malfunction, but what we were quite concerned with in reading the event report was

other equipment, similar equipment was not in operational condition and this was the one remaining one, from what I could gather from the reports, that was operating underground at the time.

So we would be concerned that whichever type of equipment was chosen for monitoring purposes that it is chosen in the context of the environment that it is expected to function in and certainly that maintenance would not let something like that occur underground where multiple pieces of similar equipment were in a non-functioning state.

So it's a combination of the choice of the equipment being used to monitor what kinds of items for the conditions it's expected to operate in and then regular maintenance to keep that equipment functioning so that it doesn't malfunction at an inappropriate time.

MEMBER ARCHIBALD: One follow-up question then. In the basis of CNSC's fairly extensive experience in uranium mining in Canada, does such technology work effectively in the mines to give effective communication of problems

such as this?

DR. THOMPSON: Patsy Thompson, for the record. As you know, Dr. Archibald, you just referenced our experience with uranium mines.

All underground uranium mines have extensive monitoring systems in place to protect workers against both -- all types of radiation exposures not just the gamma exposures from rock surfaces, for example, but also from particulates, radon and radon decay products and dust in air and so, the workers have monitoring systems in place.

There's also monitoring in the mine environment to make sure that there is redundancy in those systems so that at all times workers are protected and if -- there's alarms that would require people to pull back if doses were achieved -- were arriving at certain pre-set triggers.

And so, from our experience, there are equipment that can function underground quite effectively to monitor a wide variation of types of exposures.

MEMBER ARCHIBALD: My

presumption, therefore, is that this would not be a common occurrence in a standard uranium mine or other site in Canada that you have seen?

DR. THOMPSON: Patsy Thompson, for the record. I believe it would not be, but we will during lunch confirm with our colleagues back in Ottawa and Saskatoon to provide that update.

MEMBER ARCHIBALD: Thank you. Another question from one of your slides, I believe it was Slide 6 and this was in the prepared submission:

"CNSC has stated that the shafts and hoists were checked and decontaminated."

(As read)

And I believe on Slide 12,
Relevance of Lessons Learned:

"No additional control measures or mitigations were currently identified."

(As read)

My question to CNSC is, would radiologic or fire then contamination of shafts or other ground excavations, based upon the WIPP

event analogy, be considered to be significantly serious in effect that they would result in closure of use?

DR. THOMPSON: Patsy Thompson, for the record. I'll start responding and then I'll ask Kate Klassen and Michael Jones to provide additional information if I have missed something.

The Environmental Impact Statement required OPG to look at a range of accidents and malfunctions, and I'll try to say it in English, malevolent acts to look at the consequences from the various scenarios.

All of those scenarios were assessed, result in some cases consequences to workers that are below the criteria.

I think it's reasonable to expect that if such accidents were to happen that there might be temporary closures of areas to allow for staged re-entry with appropriate radiation protection controls in place.

MS KLASSEN: I think the only thing I would add is, again, it would depend on what type of package had the difficulty and where the difficulty occurred. It could result in the

facility being closed to regular operations for some considerable time while safe plans are developed by the licensee and certainly they would be reviewed by CNSC for a very safe considered controlled re-entry.

The issue of waste or waste continuing to arise while the DGR was being systematically inspected and re-entry would take place; Western is, as part of this project, intended to continue to operate as the site for processing wastes arising from OPG's operations.

So that kind of temporary storage of the continuing wastes arising, CNSC Staff would expect it could be managed at this point and continue to be managed at Western while the incident was explored.

MEMBER ARCHIBALD: Just to take it one step further, and this is simply because the statement was, the shafts and hoists were checked and decontaminated.

Would the development of new mitigation procedures be recommended in light of the WIPP event and lessons learned for pre-planning for mitigation of radiologic depositions in a shaft, for example? And I would also ask

this of OPG as a secondary.

DR. THOMPSON: So, Patsy Thompson, for the record. The radiation protection program that OPG is expected to have in place would have all the provisions in place to carefully consider areas that are potentially contaminated to allow essentially workers to go in safely, assessing the situation, do any investigations that are required and then proceed with the work.

I'll ask Ms Christina Dodkin to talk about the work control processes that are expected to be in place to address this type of situation.

MS DODKIN: Christina Dodkin, for the record. I'm a radiation protection specialist with the Canadian Nuclear Safety Commission.

With regards to your question, licensees are required to implement radiation protection programs and, as part of the program, they must have controls for radiological hazards which includes contamination monitoring and control requirements as well as provisions for decontamination and that would include facilities

or decontamination services as well.

So as part of the licence and moving forward for OPG and the DGR, they would be expected to have provisions in their radiation protection program for decontamination activities commensurate with the radiological hazards that are present in the different areas and equipment within the DGR.

And also, so there's also the link as well to when the emergency response would be activated and provisions under that as well.

MEMBER ARCHIBALD: Would that potentially include the decontamination from a combined fire and radiologic release event where you may have contaminated soot or whatever coating the walls? This is not just human decontamination, it's physical.

MS DODKIN: Yes.

MEMBER ARCHIBALD: And I would address the same question to OPG.

MS SWAMI: Laurie Swami for the record. We do have a radiation protection program as described that includes decontamination. It's not strictly with respect to workers, it's also with respect to surfaces

and other materials. So that program would already exist.

It would not be that dissimilar if we were to include clean-up of soot, as an example, at the same time.

So we would assess what the hazard was. The workers would be well aware of what those hazards could be and a plan would be developed that would address whatever the hazard happened to be.

It's hard to predict what that combination would be, but our decontamination procedures already would allow for clean-up of surfaces as well as people.

THE CHAIRPERSON: Apparently, we have one speaker who has to leave by 1:30, so I'm going to interrupt the questioning on the basis of the previous three speakers and proceed with a 10-minute oral presentation.

This presentation is by the Organization of Canadian Nuclear Industries. So while we're shifting chairs, we'll just take a minute here and get set up.

So, Dr. Oberth, I understand your presentation is 10 minutes. Unfortunately, we

will not have a lot of time for questions, but at least we'll be able to hear from you.

--- Pause

**PRESENTATION BY / PRESENTATION PAR:
ORGANIZATION OF CANADIAN NUCLEAR INDUSTRIES,
RON OBERTH**

DR. OBERTH: For the record, my name is Ron Oberth, I'm the President of the Organization of Canadian Nuclear Industries.

First of all, let me thank you for allowing some time for me to address this Panel and I apologize for being disruptive of the program, but maybe a change of pace might have been a good thing.

First of all, let me introduce my organization to you. OCI is an industry association representing approximately 180 private sector suppliers of products and services to the Canadian and offshore nuclear industries including the waste management industry and including the mining sector of uranium.

Collectively our companies employ more than 10,000 highly qualified and skilled

nuclear specialists who work exclusively on providing the nuclear support and equipment to the industry.

Many of our companies, as I mentioned, have provided equipment and container designs to the radioactive waste management projects in Canada and overseas.

I personally have worked in the radioactive waste management projects at both AECL and OPG during my 35-year career in the nuclear sector. So when I speak today, I'm speaking on behalf of many people in the sector who have asked me to represent them and head their association.

But if I beg, I'm going to depart from my written text here and the slides. This has been covered very amply by excellent presentations this morning by both OPG and CNSC, but I just want to say a couple of words about myself and the importance of OpX to our industry.

Personally I was very moved by the presentation early this morning by the Saugeen Ojibway Nation and their respect for air, water and land. I personally, although I live in a city, I have a great passion and love for all

of these things. I have two daughters to whom I hope to pass a safe and healthy planet and I'm sure everyone in our industry would share those same passions. So, in a sense, we're all coming from the same desire to protect the planet.

I also want to talk about the nature of our industry. I think you'll agree that our industry is represented by well-educated, respectful people who respect one another and respect the environment, all who have children and who also care about a healthy planet.

Another unique feature of the nuclear industry is we invest heavily in ensuring safe design, quality in our products and services and we invest in education and training and developing a strong safety culture. So safety is the number one priority of everything we do in our industry.

Another unique feature of our industry is that it is a very open industry and an industry that shares, and we've talked this morning about the openness of the people at the Waste Isolation Power Plant in sharing their experiences, in documenting their experiences so

that others in the industry can learn and benefit from that experience.

Even though I represent 180 companies who sometimes compete with one another, a key element of our industry is we share experience, we learn from each other's mistakes, we share each other's improvements. So OpX is a critical part of our industry and a critical part of why I think our industry is a safe and a dependable industry.

So what I would take from the OpX and WIPP is that the incidents at WIPP fall within the events that were postulated in the DGR and the WIPP incidents reinforces our determination to learn from OpX, to build OpX into future considerations as appropriate.

And I think your questioning of the panel of the experts this morning focused very much on how we can learn from the OpX at the WIPP and I think the responses that you've heard indicate a strong willingness to do that.

Sorry, I keep pushing this the wrong way. So the conclusions that I would want to draw, because I think we've gone into enough detail on this, is that our industry builds

defence in depth into everything we do, into design of mines, into designs of containers and our record, I think, speaks for itself.

And I just want to remind the Panel and the audience that this month this industry will hit an important milestone. On September the 30th, 1954 was when the first nuclear submarine, the Nautilus, was launched in the U.S.A. It was launched at the leadership of a man named Admiral Hyman Rickover who at that time, 60 years ago, instilled a culture of safety and defence in depth into our industry and I would assert that the 60 years of experience with the deployment of nuclear technology for propulsion purposes and, more importantly and more relevantly to today's discussion, in the production of power, has been done with utmost safety in mind.

In almost 60 years of experience, we've had three events that have been considered serious events; two of which caused a loss of life. From each event we learn, we modify and we improve.

And I would assert that that track record of our industry is a very powerful

and excellent track record and I would like to assure the Panel that the experts in this room, particularly in OPG and NWMO and the oversight of the CNSC will ensure that the lessons learned from WIPP will be incorporated in the very safe design and construction of the DGR as well as the safety culture, the important safety culture that will be required to operate that facility safely for a long period of time.

So in closing and within my 10 minutes, I just want to say that our industry, the organization that I represent, the 180 companies and the 10,000 people, do support OPG's application and believe that OPG does have the skills, the safety culture and the excellent personnel, with the oversight of the CNSC, to safely construct and operate a DGR at the waste site.

Thank you for your time.

THE CHAIRPERSON: Thank you, Dr. Oberth. Perhaps we have time for a couple of questions from either Dr. Archibald or Dr. Muecke. Dr. Archibald, did you have a question?

MEMBER ARCHIBALD: I'll come back roughly to my last theme, if I may. The report

for the release incident indicated that the continuous air monitor for radiation detection malfunctioned and was taken offline.

Had this malfunction occurred prior to the actual event, delays in reporting could have prolonged exposure hazards to workers had they been underground and to the surface environment.

My question to you is, would the detector malfunction be considered by the nuclear industries that you represent to be one of the critical controls that must be used to isolate radioactive waste from the environment and would it be a primary defence in depth feature for a DGR?

DR. OBERTH: That's a technical question that I would defer to the experts who are designing the facility. I can only assert that a careful consideration of that will be taken and I would defer to the experts to decide to what degree that experience will be incorporated into new designs.

MEMBER MUECKE: I'm afraid one or two of my questions would be technical, too --

DR. OBERTH: Okay.

MEMBER MUECKE: -- so I'll put it in a more general sense. How was your membership consulted in preparation of your submissions?

DR. OBERTH: I have a Board of Directors to whom I report. I advised the Board of my decision to speak at this hearing. I shared the presentation with the Board, I did not share it with all 180 members, but I've been in this position for three years, the membership understands what we do as an organization and when I speak for the industry I am representing the interests of those members.

THE CHAIRPERSON: Thank you. All right. I think we'll take our scheduled lunch break. We will be reconvening at 2:00 p.m. and we'll be resuming the last few questions related to the first three presentations of today.

Thank you and we'll see you at two.

--- Upon recessing at 12:32 p.m. /

Suspension à 12 h 32

--- Upon resuming at 1:59 p.m. /

Reprise à 13 h 59

MS MCGEE: Good afternoon. If I could ask everyone to take their seats, I'd like to begin this afternoon's proceedings with a brief statement.

The Panel wishes to acknowledge that several people have asked for permission to present proposed questions through the Chair. The Panel's first priority is to ensure that everyone scheduled to present today is heard and the Panel is able to ask all of their questions for each presenter.

The opportunity for intervenors to ask a question through the Chair is subject, in part, to the availability of time together with other considerations.

Therefore, the Panel will hear from all of today's registered presenters and will complete their questions before determining how much time is available to consider proposed questions from registered intervenors.

Thank you very much.

Good afternoon. The Panel will now resume our questions related to the first three presentations of this morning from OPG, CNSC and the Ministry of Labour.

At the close of our questions, then we will proceed with the next scheduled presentation.

Dr. Archibald.

MEMBER ARCHIBALD: I have a question for CNSC.

The Panel wishes to confirm the tritium levels at the proposed DGR are too low for existing technology to remove. Is that correct?

DR. THOMPSON: Patsy Thompson, for the record.

That is my understanding.

MEMBER ARCHIBALD: And would there be any existing technology or process that could be used to immobilize and/or capture tritium at concentrations higher than the existing if it, for example, did occur at the DGR after its release into the surface environment?

DR. THOMPSON: Patsy Thompson, for the record.

My understanding is that technologies do exist. For example, OPG has a tritium removing -- removal facility, so technologies exist to immobilize or put tritium

in a form that it is stable in containers, but it's for essentially very high quantities.

Emissions from a nuclear facility such as the DGR or NPPs, for example, emissions through air, that technology doesn't exist, and once it's out in the environment, we rely on dispersion, essentially, to remove any concentrations that would be above safety levels. But we essentially rely on, essentially, administrative controls and engineering controls to make sure that -- or minimize the likelihood of an accident occurring that would result in such types of concentrations.

MEMBER ARCHIBALD: Thank you very much.

And to OPG, are individual waste containers able to be sealed effectively in place so that operations could continue safely in the event of a breach or would rooms be required to be sealed for the purpose of contaminant containment?

This is by example by analogue to the WIPP event.

MS MORTON: Lise Morton, for the record.

So again, just to understand the question, with respect to whether individual containers could be sealed, as I mentioned earlier, and particularly with respect to our low level waste containers, some of them are not perfectly hermetically sealed and they could be, I guess, potentially over-packed. But some of them necessarily would not be sealed.

We would rely on our radiation protection program more than anything in the event of a breach of a container.

And then I'm going to defer to Derek Wilson here for further information as well.

MR. WILSON: Derek Wilson, for the record.

Within the emplacement rooms themselves, should there be a situation where there was a radiological contamination that was deemed beyond that of normal operating condition for radiation protection, there's provision within the design of the facility to actually isolate specific rooms, emplacement rooms, through the closure of the back wall panel as well as initiating a closure wall in the opening

of the rooms.

So we have the ability to isolate a given room within the repository should that condition exist.

MEMBER ARCHIBALD: So essentially, the plan would be to isolate the room itself rather than go after individual containers.

MR. WILSON: Derek Wilson, for the record.

That would depend, again, on the -- on the level of contamination within the given emplacement room. If the radiation protection program and the assessment of that determine that it was feasible to go in and retrieve and over-pack the packages and it was deemed to be the appropriate course of action, then that could be one option.

The other option, again, would be to isolate the room itself and segregate it from the remaining open operating panels.

MEMBER ARCHIBALD: Thank you.

And I'd just like to pose one last question. This is a follow-up from one I posed this morning.

This is concerning the case where there may be radiologic or non-radiologic contamination of excavation walls, shaft walls, ventilation exhaustways where people are still required to operate.

Does OPG have any plans in place or is there planning assembled for considering mitigation procedures and, for this to be more specific, for wall washing, for the placement of removable liners, for example, that could be removed in the event of one of these breaches and contamination so that operations could continue with minimum disruption?

MS MORTON: Lise Morton, for the record.

So I know Ms Swami answered this in part this morning. I'll try to reiterate part of that, and then I'll ask Derek Wilson to add to it as well.

So again, we already have RP procedures with respect to decontamination and with respect to all of our RP fundamentals, if you will.

Depending on if there was a contamination event, depending on the extent of

that contamination, the source, et cetera, at that time specific remedial procedures would likely as well have to be developed.

I do understand you're asking if there's any ability to foresee that ahead of time with respect to mitigation procedures for wall washing, removable liners. From a design perspective, I'll ask Derek Wilson to comment on that.

MR. WILSON: Derek Wilson, for the record.

Again, the design features that have considered for the -- an upset condition and a radiological release, we've tried to limit the exposure of the facility to such a release through our ventilation design and through the design of the shafts themselves being concrete lined from top to bottom. So we have very similar types of services that you would expect even in the existing operations to be able to mitigate those activities.

THE CHAIRPERSON: This is directed to CNSC.

I understand you have some information for us arising out of this morning?

DR. THOMPSON: Patsy Thompson.

That's correct, Dr. Swanson. The question was on the availability of continuous monitors in mines and whether they are subject to failures. And so the information we have is that there are two methods being used for monitoring for radiological protection of workers, among others.

The two main ones I'll speak to are some called grab sampling and continuous monitoring.

And so the two of them work together and are called upon in the code of practice that is a condition of CNSC licence.

The grab sampling is carried out by the radiation technicians on a regular schedule at various locations in underground workplaces, and the results are obtained relatively quickly, within about 15 minutes. And it serves, essentially, to confirm that the air quality is within design conditions and that engineering controls such as air flow quantities and direction of flow are as planned.

And the grab samples can also be used for radiation planning for planning of the

work.

The other system is continuous monitoring, and that's done by fixed monitors installed in strategic locations in the mine or a strategic -- or specific workplace locations. The monitoring device samples the air quality on a continuous basis and identifies the radiation concentration range by using a traffic light system, so green, yellow and red.

And the green light essentially indicates that the air quality is good and within specifications. Yellow light indicates a change in conditions is occurring, and a red light indicates that workers should essentially withdraw, leave the workplace.

The continuous monitoring devices have been in use in Saskatchewan since the -- essentially the 1990s.

The devices are on a calibration schedule to ensure accuracy of measurements. Because these devices provide a visual indication of the conditions, workers are trained to notify the radiation staff if the light is yellow or green -- yellow or red and take actions in accordance with the code of practice.

There have been occasions where malfunctioning of devices have occurred. These occasions are rare, and mostly because lack of power supply. And those situations, essentially the grab samplers are used to continue to ensure the health and safety of workers.

THE CHAIRPERSON: Thank you very much.

Dr. Muecke.

MEMBER MUECKE: Just two sort of follow-up questions to OPG, first of all.

What would be the communications protocol used by OPG when the radiological exposure of a worker due to an incident were to fall below the allowable limit?

MS MORTON: Lise Morton, for the record.

Just to confirm, do you mean if the exposure level is below the regulatory limit or above? You've exceeded it.

MEMBER MUECKE: Below and after an incident where there has been a radiological release.

MS MORTON: Lise Morton, for the record.

So there are various notification protocols.

So for regular routine operations, our staff are all qualified nuclear energy workers and they will have -- in accordance with what the health physicist has deemed based on the work that they perform, they will have a routine, for example, bioassay frequency and a whole body count frequency.

And so in other words, they will submit urine samples, for example, on a routine basis.

Through that process, they will get a notification if there's been any kind of dose exposure or dose exceedance in any way.

In the event of an extreme case, for example, as well, then there are other methods as well that health physicists can prescribe with respect to things like fecal samples, et cetera, and there's a protocol in place for when those results are obtained, how that notification occurs to the individuals. I was having this discussion recently with the health physicist so, for example, if there was a serious event that was to occur, such as

something for example that has happened at WIPP, then you can go as far as having face-to-face discussions with the employees and also prescribed rollouts, and typically you would involve the union membership in that kind of thing, so there is a protocol in place that the health physicists follow for that.

I'm not sure if Ms Swami can maybe add to that.

MS SWAMI: Laurie Swami, for the record.

The only thing that I would add is that from a dose perspective we have a very detailed planning program that we use to establish what we would expect a dose exposure for a worker would be. That is controlled through a radiological exposure permit which allows the worker to go to work. If through the programs that Ms Morton has described there is something that is above what would be expected for the job, we notify the employee. We also look at the job to look at ways that we may have provided too low an exposure or look for ways of mitigating that for the future.

There are a lot of activities

that take place when there is an unplanned exposure. We take those very seriously. It is part of our program to follow up to make sure the employee knows what happened. It's also important for management to understand what happened so we don't have unplanned exposures.

I would also mention the responsible health physicist is the person who is licensed through the CNSC's certified program, so they have a great deal of knowledge and understanding of health physics and they are the ones that would be in communication with the employee should there be something that significant.

MEMBER MUECKE: Thank you.

Basically, what you are telling us is that if there is any sort of incident there will be a prompt notification for anybody who may have been exposed regardless of whether the exposure proves to be beyond the limit. Am I interpreting that correctly?

MS SWAMI: Laurie Swami, for the record.

Yes, you're interpreting that correctly.

As described by Ms Morton, there are different ways. We have whole body monitors that people would pass through, different types of -- looking for potential contamination, bioassay samples. They can be done on a rush basis so that if we knew that exposure may have occurred we would obviously send that in quickly, ask for a quick turnaround time so that we could get that exposure. We also require our staff to wear electronic personal dosimeters which would provide alarms and a real time readout based on external exposures. There are many, many ways that we are monitoring and the employee gets direct feedback.

Our employees are trained to understand the readouts. They are trained to respond appropriately, which is if there is an alarm they would back out of that situation. They would be monitoring their own exposure on a routine basis so that if they saw something approaching the limit we expect, and they would follow that, they would back out of that situation so they would not get an unplanned exposure. Unplanned exposures are a very important part of our program and we have many

ways and means of making sure that doesn't occur.

MEMBER MUECKE: Thank you.

Coming back to waste packages, is there any record of waste package breaches having occurred at OPG stations during transportation of the waste or at the waste management facility, and to add, particularly with respect to intermediate level waste?

MS SWAMI: Lise Morton, for the record.

No. With respect to any record of waste package breaches during transportation and in particular with respect to the transportation of intermediate level waste, there have been no waste package breaches at all in our history that I can recall. I'm quite confident with that.

With respect to intermediate level waste, we have to keep in mind again that the packages that are used to transport radioactive intermediate level waste, as well as the containers that are used for that, are robust containers that are engineered, and the transportation packages that are used are following the standards by the International

Atomic Energy Agency. They've gone through impact testing and quite an extensive amount of testing, so they're engineered to prevent breach of package.

With respect to low level waste, I mentioned earlier how we had done many visual inspections and we had relocated a lot of low level waste packages over the course of the last 20 years or so. We didn't find any evidence of waste package breach. There were isolated cases of some corrosion and degradation of carbon steel containers, which is to be expected. When we do encounter that, and it is relatively uncommon, we do have an overpack available and we will overpack that container immediately, but the package itself wasn't breached, there was just some corrosion evidence starting to appear.

MEMBER MUECKE: Thank you.

THE CHAIRPERSON: I have a few remaining questions. I'll start with OPG.

Has OPG ever experienced a fire at any of its facilities and, if so, what was learned?

MS SWAMI: Laurie Swami, for the record.

Yes, we have experienced fire events at our facilities. Ms Morton is going to describe some of those for the waste management facility.

Every time we would have an event we would do an investigation, whether it was a root cause for a significant fire or something that we would call an "apparent cause" evaluation. We would do those evaluations, take the lessons learned from that, develop corrective actions and implement those actions. When we do that, we don't just focus on the one facility that may have had an event; we would take that information and share it across all of our facilities. If it was significant enough it would also enter into the OPEX program that we described this morning where we would share that with other operators and other members of the nuclear industry so that they too could learn from those events. That is an important part of the process that we have in place, but I'll let Ms Morton speak to some specific examples.

MS MORTON: Lise Morton, for the record.

In our knowledge, we have had

three minor fires at the waste facilities over the course of the many years we have been operating. The most recent one was actually earlier this year and it was related to our incinerator. Understandably, by nature an incinerator has fire in it. Therefore, there is a risk with respect to incinerators. In this particular event, what happened was an air supply duct that fed the bottom, what we call the under fire air system on the incinerator, overheated so the fire, if you will, or the smoke was contained within the duct itself. What externally we saw was the paint peeling off of the top of the duct, but we consider that a fire in our words.

Exactly as Ms Swami said, what we have done then is a substantial engineering analysis of why that occurred, with an investigation report that's published. We then have recommendations. In this case, we suspended the incineration of solid waste and we continue to do that right now because we need to implement some modifications to prevent the recurrence of a similar event. That involves modifying that particular pipework and duct and the way it is configured. That was one of the events. We had

a similar one the year before around the same location, so when we had the bit of a repeat event we looked back to say: why didn't we catch it the first time and what did we miss the first time? That accounts for two of the ones that I spoke to.

Then our records also show that back in 1988 there was a small fire in a bale of incinerable waste. Prior to our current use of a compactor we had an older piece of equipment at the time, in the '80s, that was called a baler and it produced kind of a cardboard package of compacted waste. Shortly after they had compacted the bale the bale caught on fire. The investigation found that there had been an aerosol can in amongst the baled waste and after having been compressed of course through the compactor that was the source of the fire.

What we did as a result of that one, when we looked back on the records and we confirmed that this is still the case, is we've excluded aerosol cans from our waste. That's another example of where the waste acceptance criteria changes, for example, so now the stations have procedures in terms of segregation

of aerosol cans, and that's a waste stream that's dealt with in a different manner.

THE CHAIRPERSON: Thank you.

Would OPG please confirm for the panel that both the fire and container breach scenarios modelled in the EIS were more severe than the WIPP incidents?

MR. GIERSZEWSKI: Paul Gierszewski, for the record.

With respect to the fire event, the fire events that we considered were those involving packages so of course the event was not involving any radioactivity, it was a conventional equipment fire, so our analyses were more conservative in that respect. They assumed the vehicle had a waste package.

With respect to the package breach, at this point I don't know enough details about really what exactly happened at the WIPP event to make that particular statement.

We believe that our analysis is appropriate for our waste packages and conditions. I've seen nothing to suggest otherwise, but I can't make that definitive statement.

THE CHAIRPERSON: Thank you.

Again, to OPG. Has the WIPP container breach incident led OPG to consider contingency plans for inspection of waste packages in rooms?

MS MORTON: Lise Morton, for the record.

The WIPP event on the radiological release has not led us to reconsider our contingency plans for inspection. I think we described in the hearings last year that, again, the way the waste would be placed in the room is really from back to front and as a result of that a visual inspection on a routine basis is not practical.

I believe, Derek Wilson, you might have something to add to that.

MR. WILSON: Derek Wilson, for the record.

When looking at the incidents and looking at the availability of the placement of waste in the in-placement rooms you have to weigh the benefit of being able to inspect over time with the risk of doing such an activity both from an RP perspective as well as from a conventional

safety perspective. For those reasons and given the history that we've seen and given the campaigns that Ms Morton has spoken to previously about the condition of the waste when they removed the packages from the seven LSPs, about 40,000 cubic metres of waste, there was no visual indication of package breach or package wear beyond, as she has mentioned, on a couple of the packages. Really that doesn't lend us to look at an option to go in and inspect on an ongoing basis in a DGR.

THE CHAIRPERSON: To clarify, given that the Western Waste Management Facility has been operating for some decades now, 30 or so years, and that the DGR can be expected to operate for at least twice that long, I would imagine, you're still confident that over that time period you would be able to confidently fill a room, close it and feel that there was really no further need to be reassured about the condition of the packages while still operating.

MS MORTON: Lise Morton, for the record.

Something that I probably should have added that might help in that context as

well is, as we have been talking about the waste acceptance criteria for the current facility there is also a waste acceptance criteria for the DGR and that will involve the packages being in what we term DGR-ready condition. I think it is important to note that as packages are retrieved from the existing waste management facility they will have been inspected again at that time regardless of their age, overpacked as required prior to transfer to the DGR, and additionally inspected prior to placement in the DGR rooms. It is those additional measures as well that serve to provide some of that confidence that you're speaking of.

Derek Wilson is going to add further information.

MR. WILSON: Derek Wilson, for the record.

I think another important aspect of this is that the long-term planning of the facility is that there will be stage periods where the in-place waste will be isolated. We're not looking to have an exposed condition where packages would be available to degrade over time and enter into the ventilation stream because we

would in-place a panel of waste. Looking at the waste stored at the Western Waste Management Facility, it would go in first, that would then be closed and then we'd look at receiving waste, which would be new packages, into the facility, and that would be for a period of time, and then we'd close that panel as well, so when we isolate the panel, we're isolating that from any contact to the external environment.

THE CHAIRPERSON: Thank you.

My last question for OPG is how often has the Western Waste Management Facility had to reject waste that doesn't meet the waste acceptance criteria and if you had to reject any of them, what were the primary reasons for rejection?

MS MORTON: Lise Morton, for the record.

Having to reject waste does not occur often. In terms of how often, I'd have to check records.

The few times that I can think of that have happened in recent years had to do with concerns around hoisting and rigging of the waste package. We did have to return some intermediate

level waste packages to the stations simply because there had been changes in the configuration of the hoisting/lifting mechanism involved with the container that for our procedures there were concerns raised by our licensed mobile crane operators in terms of lifting the container. That is the one example I can think of where we have rejected waste, but you're not rejecting the waste itself more than the integrity of the package perhaps. Other than that, I honestly can't think of any other instances where we've had to reject waste. I'd have to search in records.

THE CHAIRPERSON: Would you confirm with the panel that really it is back to the power generating station's staff themselves to ensure that by the time it gets to you it already meets your criteria? Are we correct in that assumption?

MS SWAMI: Laurie Swami, for the record.

It is the waste generator's responsibility to ensure that the, if you will, correct material is sent for waste disposal. It is certainly something that the site staff are

responsible for doing. They understand what the requirements are.

Working from the site side of it, I have been involved where there has been something that's been rejected and sent back to the site for appropriate response. When that occurs that is a very big deal for us. Again, that goes into our station condition record system that I talked about earlier. We do an investigation as to why it happened and what we can do prevent it from happening in the future, so when it does happen it's a big deal. We take it very seriously because it's not to the station's benefit and it's certainly not to the benefit of the waste receiver that we don't have the appropriate materials being sent there for disposal. That is a very important concept that we follow up very rigorously when it does occur.

THE CHAIRPERSON: Thank you.

I now have a few questions for CNSC and it's back to the question the panel had earlier regarding filtration at the exhaust ventilation system.

Dr. Thompson, you explained that the concentrations would be sufficiently low,

that the filtration would not be considered to be required, but the panel would like a further explanation about how now requiring filtration is in accordance with the ALARA principle in this particular instance.

DR. THOMPSON: Patsy Thompson, for the record.

I will use one of the examples we talked about this morning. Following the WIPP event we took a look at the assessment of consequences from a release of radiological material with and without HEPA filters. Essentially, what we found is because of the characteristics of the waste that are proposed to be disposed of in the DGR having HEPA filters made little to no difference in terms of the radiological exposures. It's from that point of view, if there had been differences or if it had a benefit of having HEPA filters in place, we would require that OPG consider putting filters in the design of their system. Having said that, I think we have said on a number of occasions that the processes -- the EIS used accidents and malfunctions -- were binding for the safety case. On that basis, we have brought conclusions on the

basis of the mitigation measures that have been identified.

Moving forward, it is the expectation of the CNSC that as the project moves forward, if it is approved and we get closer to the actual design of the systems, that more knowledge will be available, including from the WIPP event where the root causes will be identified and more information will be available to consider in the OPEX program that any detail design would take into consideration the findings of the WIPP and other information that may become available. The expectation is that the facility be designed to minimize and essentially reduce or eliminate exposures where possible, but we also look at the feasibility of putting in-place systems, their benefits as well as the offsetting. For example, some filter systems require maintenance and so if the maintenance would put workers at exposure we need to consider also the potential exposures to workers from maintenance of those systems in relation to any benefits we would have, for example, for releases to the environment. We are expecting OPG to look at the system as a whole, not just one part of

it.

THE CHAIRPERSON: Thank you.

In the experience of the CNSC, what lessons learned at uranium mines could be applied to the DGR with respect to conventional mine safety given what we've heard about WIPP?

MS THOMPSON: Patsy Thompson, for the record.

I'm looking at my colleague on my left and I'll start responding with the information I have available and, if needed, will contact our uranium mines and mills specialist in Saskatoon for additional information.

To my knowledge, the more significant events that have occurred at the currently operating uranium mines in Saskatchewan that had a potential impact on worker health and safety were the flooding events at McArthur River and Cigar Lake. Those were very significant events where a lot of time and effort has been spent on the part of the CNSC to look at what had happened, look at contingencies and mitigation measures to make sure that the design was reassessed. There was a lot of emphasis on the safety assessment and the response plans so that

moving forward there was enough pumping capacity, enough analysis done of the geology to make sure that mining wasn't happening in the same types of conditions.

There have also been issues early on when McArthur River was being developed where essentially we had the mining companies included and CNSC and not as much experience with regulating activities in very high-grade ore.

And so at that time, through the monitoring systems that I described earlier, we identified essentially polonium 210 and lead 210 in quantities that were quite unexpected. And at that time we required Cameco to put in place systems in the mine to degas the groundwater flow that had radon and radon decay products before it was being rejected.

And essentially, adjustments were made to the Radiation Protection Program and the mine water management plans as well.

And so what I would say is we have a lot of experience with reacting to issues as they come up. And over time, we have also had refinements in our expectations, essentially through management system implementation, to have

better assessments and better design and change control over time.

MS KLASSEN: Kay Klassen, for the record.

I would say some of the issues in a general sense with underground mining has to do with accidents related to vehicle movements. I mean, most workers are injured by vehicles moving, getting pinned, getting crushed because of moving objects or vehicles.

In that aspect, OPG is planning to not engage in construction and waste placement operations at the same time. That is the current practice at WIPP.

It certainly has caused a problem with respect to maintenance of the vehicle carrying salt as being slightly less than a vehicle carrying a package.

But the whole concept of integrating two different kinds of activities is a hazard. It is one that the current DGR project is endeavouring to avoid by separating out waste placement activities from construction activities.

Related to that is, in general

mining, a lot of accidents occurred where there is a change in activity. When you go from underground activities and you are moving into surface-related activities there are accidents associated with typically the waste rock coming up from the underground and then moving on to the surface. It is that interface that has caused us a lot of accidents as well in general conventional mining.

And again in that aspect, I believe the plan for the DGR project through us trying to separate construction-related or waste rock removal activities from other activities in the context of the operation is being addressed that way as well. That is what I can suggest at this time.

THE CHAIRPERSON: Thank you.
That was helpful.

MS THOMPSON: If I may? We have been asking our colleagues if there was ever a fire event that we have had to respond to and from a regulatory point of view. So as soon as we have the information we will provide it.

THE CHAIRPERSON: Thank you.

Has the CNSC ever had to require

corrective action of OPG regarding management oversight of contractors?

MS THOMPSON: Mr. Dan Papaz, the Management System Specialist, will provide an answer to that question.

MR. PAPAZ: Dan Papaz, Management Systems Specialist, CNSC.

Recently CNSC contacted to do inspection after Darlington for the new project for the new build. And CNSC found issues of contracting that time and OPG took the action. So, yes, we have sometimes -- if that is the one, it stands out now from my colleagues' experience working as an inspector for OPG.

THE CHAIRPERSON: So if I may ask a follow-up question then please?

Since there were some required corrective actions at the Darlington new build, am I correct?

MR. PAPAZ: No, it is for refurbishment.

THE CHAIRPERSON: For refurbishment, sorry.

MR. PAPAZ: Refurbishment.

THE CHAIRPERSON: Could you

please provide us with some specifics regarding those corrective actions?

And perhaps try and hone in on some of the key issues we have heard about with WIPP, which were largely around safety, culture and communication between the contractor and the operator.

MR. PAPAZ: Dan Papaz, Management Systems Specialist, CNSC.

I have to ask my colleague for specifics. I know they have a problem with training and the qualification, but I don't know exactly the specifics. So I can provide the information later on.

THE CHAIRPERSON: OPG, could you help with this please?

MS SWAMI: Laurie Swami, for the record.

Routinely, the CNSC does inspections of our facilities and programs, and routinely will issue various types of actions to us. So there are a variety of different types escalating to, you know, when needed they would issue directives.

I would ask that Mr. Webster come

forward and maybe give a little bit more information on the particulars of this particular inspection.

MR. WEBSTER: Allan Webster, for the record.

The inspection findings were around the qualification of engineers in the contracted companies we were using and their records that they were keeping of those qualifications, and how we were checking those records. So that was the nature of the findings.

THE CHAIRPERSON: So in other words, it wasn't, as far as I can understand, similar to the kinds of issues we are hearing about this morning with respect to WIPP and --

MR. WEBSTER: No. No, very different issues.

THE CHAIRPERSON: Thank you.

Another question for CNSC. Why did CNSC not comment on the worker injuries caused by smoke inhalation due to the WIPP fire? The panel have received some written submissions, that allege anyway, that at least one of the workers is still under medical treatment for smoke inhalation.

Can you confirm whether or not that is an accurate portrayal? And what in fact would constitute a significant injury from smoke inhalation?

MS THOMPSON: Patsy Thompson, for the record.

The information in our submission and in today's presentation reflect the information that is available on the WIPP website. And so our understanding is that the workers who were initially -- that suffered from smoke inhalation were treated and were not admitted to the hospital.

And so we described essentially the information as it appears on the WIPP website. That is the only information we have.

We have also noted in our assessment that there were several failures in the manner in which the event was responded to at the WIPP, including the direction that was given to employees at the time of the fire. The reversal of airflows and all those things we would expect any licensee of the CNSC to not do, and essentially have procedures in place that they comply with.

And so that is our assessment. I don't know if the information from the intervener is accurate or not. That is not what we have at our disposal.

THE CHAIRPERSON: And one final question for the CNSC. And this is a question the panel would appreciate just in terms of perspective.

Is the CNSC aware of the radioactivity level in Panel 7 where the breach occurred relative to worker exposure limits?

MS THOMPSON: Patsy Thompson, for the record.

We don't have knowledge on the operating conditions underground in Panel 7. The only information we have is what we have provided to the panel in terms of the levels of exposure to workers during the event.

THE CHAIRPERSON: Thank you.

I am assuming my fellow panel members have no further questions?

So we will then be able to proceed with our next presentation, which will be by the Society of Energy Professionals.

You do have 30 minutes allocated.

When the amber light comes on, it means you have five minutes. And then the red light comes on, you are done.

Please proceed.

**PRESENTATION BY / PRÉSENTATION PAR:
SOCIETY OF ENERGY PROFESSIONALS, SCOTT TRAVERS
AND ANDY D'ANDREA**

MR. TRAVERS: Thank you. We won't need our full 30 minutes.

I would like to thank the panel for the opportunity to speak with you today and to make our presentation. My name is Scott Travers, I am the President of the Society of Energy Professionals. And with me today is Andy D'Andrea. Andy is a unit director at Ontario Power Generation at the Pickering Nuclear Generating Station.

Our organization represents more than 8,000 employees working in 13 different electricity industry companies in Ontario. And almost half of our members work in or support nuclear energy at organizations such as Ontario Power Generation, Bruce Nuclear Power, Nuclear

Waste Management Organization, and AMEC Nuclear Safety Solutions.

Our members are all professionals and include first line managers and supervisors, professional engineers, scientists, as well as many other professional occupations.

At OPG, Society members provide technical expertise in areas of conventional and health and safety, radiation safety, emergency preparedness and environment.

As professionals who not only work in the industry, but who live and raise families in the host communities, the Society and its members are uniquely placed to comment on the Deep Geological Repository.

The Society strongly supports the DGR project as a logical and safe solution to deal with nuclear power generated waste, such that all potentially harmful materials are permanently isolated from inadvertent or malicious human contact.

Canada already has over 60 years of experience in safe handling in surface storage of radioactive waste. It is the Society's belief that it is now time to move to the permanent

storage solution.

A permanent Deep Geological Repository is the most acceptable solution to isolate potentially harmful materials from human contact without requiring institutional controls.

Research on deep geological disposal has been conducted for more than 50 years and site-specific studies and data gathering has been conducted with the objective of finding a site with a rock formation that will be stable over geological time periods that could safely accommodate a waste repository.

The site-specific studies conducted confirm the technical suitability of the site chosen for the DGR.

So the Society believes that the minimization and mitigation of objective risk, rather than perceived risk, should be the primary and overriding import to the joint review panel.

All of the potential options for the stewardship of nuclear waste possess an associated relative risk, which is the product of the probability of an event occurring and the consequence of that particular event.

As difficult as it is to predict

the probability of any future event from occurring, probabilities and consequences which determine objective risk are, to some extent, empirically noble. They can be estimated and modelled within set parameters.

As the report of the Independent Expert Group reveals, perception of risk is largely divorced from the key concept of probability and is extremely difficult, if not impossible to empirically measure.

When we look at risk perception we know that outreach and education have a significant positive effect on risk perception and community acceptance.

Survey evidence shows that those who are better educated in general and those who have more knowledge about nuclear energy and radiation in particular are more supportive of nuclear projects.

Only in large part to the substantial stakeholder engagement efforts of the project proponent and others in the industry public opinion surveys have repeatedly demonstrated that both factual knowledge of and support for the nuclear industry are higher in

our nuclear host communities than they are elsewhere.

Given this, the Society believes that the most important question facing this panel is not determining which solution has the lowest perceived risk, it is determining which solution has the lowest objective risk.

It is the Society's belief that based upon objective risk the proposed DGR presents the best possible solution to long-term treatment of nuclear waste. Neither the existing Western Waste Management Facility, the WWMF, nor potential enhanced surface storage at the WWMF can truly be considered long-term solutions, at least not on the scales of time, which must be contemplated for this particular issue.

Both of these are ultimately status quo options with waste being managed on an interim basis.

The Society is strongly of the opinion that we need to move to a long-term plan that does not require institutional controls.

Both the proposed DGR and limestone bedrock of the Cobourg Foundation at the Bruce Nuclear site and a conceptual DGR in

granite bedrock of the Precambrian/Canadian Shield can legitimately be considered long-term solutions.

However, for a number of reasons the proposed DGR at the Bruce site provides advantages that a repository in the geographically distant area of the Canadian Shield would not.

Much of the waste to be dealt with is already at the Bruce Nuclear site and it has been safely stored there for over 40 years. As a result, there is a tremendous wealth of experience and expertise at the present site and a strong proven safety culture that will be transferred to the construction and operation of the DGR.

The local host community is relatively well-educated with respect to nuclear energy and radiation issues and is generally supportive of the nuclear industry and nuclear projects, albeit clearly this is not without exception.

The proposed Bruce DGR would rely on well-established transportation routes and long-standing relationships and practices of

consultation with key stakeholders along the route.

For over 40 years radioactive material transportation department has safely transported tens of thousands of shipments of radioactive materials across the Province of Ontario and has never had a significant accident and never had a release of radio activity that impacted the public or environment.

For all of these reasons and based on international best practice, the Society is confident that the Bruce DGR is the best option from the perspective of minimization and mitigation of objective risk.

The Society would also like to address the applicability of recent events at the U.S. Waste Isolation Pilot Project Facility.

As has been discussed today, there were two major events associated with this facility: February 5, 2014 fire underground that necessitated the evacuation of the mine; and a February 14, 2014 release of radioactive contamination to the environment.

Although the approximate cause of the waste container breach is still unknown, the

immediate cause of the fire was determined to be engine fluids coming into contact with hot surfaces.

Department of Energy

investigators found that the accident was preventable and identified several key contributing factors including: inadequate preventative and corrective maintenance of equipment, including safety-related equipment; inadequate follow through of fire protection programs, standards and training, field procedures and reinforcement of acceptable field conditions; inadequate training and qualification of operation staff for their emergency roles; elements of the emergency preparedness were not maintained and/or tested for adequacy; and ineffectiveness of various oversight groups in indentifying and correcting weaknesses.

As has been discussed so far today, OPG has considered an underground fire and, as such, has guarded against this possibility in both its design and its processes. This includes fire prevention and the minimization of the use of combustible materials, fire detection equipment, fire suppression

equipment, communication equipment and notification systems, use and location of portable refuge stations, and egress and emergency responses.

This ensures that a similar event would be unlikely to occur at a DGR.

However, from the Society's perspective, the DOE investigator's report on both the release and the fire, speak to factors more basic and more troubling than any specific hazards.

Their report identified a degraded safety culture at the WIPP, a culture in which safety program design, implementation, training, and execution were all seriously lacking and one in which employees felt chilled from raising their safety-related concerns to management.

The Society can quite definitely and assertively say that such a degraded safety culture does not exist at OPG or the NWMO and I would like to pass the microphone to Andy D'Andrea who will speak at more length on the safety culture.

MR. D'ANDREA: Andy D'Andrea,

speaking.

So as Scott was saying, you know, the Society can say quite definitely and assertively that such a degraded safety culture does not exist at OPG, the NWMO or indeed at any workplace where the Society is a legally mandated partner in the Internal Responsibility System, the IRS.

Our members and our union are uniquely motivated and uniquely situated to act as an additional safeguard of the public trust in the Bruce DGS and indeed in all of Ontario nuclear operations.

There is no one who can claim to have higher stake in the safe and environmentally responsible construction and operation of the Bruce DGS than our members and their families.

Our members would work inside and in close proximity to these facilities. They would be among the first in harm's way if the high standards of safe design, safe operating procedures, and day to day occupational health and safety are not adhered to.

They live in Tiverton, Kincardine, Saugeen Shores and surrounding

communities and their children drink the same water and breathe the same air as all local residents.

Because of our occupational positions, training and experience, and thanks to our independent role in the Internal Responsibility System at OPG, we are in a position to enforce the most stringent of standards. It is a position and a responsibility that we take very seriously.

OPG nuclear waste has a strong safety culture. All staff are introduced to a human performance program that includes a number of, as we call it, event-free tools used to focus employee attention and ensure that we are performing to the highest standards. All employees are trained and qualified to conduct all their duties.

The Internal Responsibility System requires a shared responsibility among all employees. Employees regularly review this program, this includes the opportunity and obligation to raise a concern and escalate if they are not satisfied with the resolution.

The condition is reviewed by

management and the actions are tracked using an employee-accessible database or the station condition record system as it was appointed previously.

I would also like to point out that as other organizations with more than 20 employees, OPG has joint health and safety committees to ensure safe working conditions and operations.

Society-appointed members sit on various workplace joint health and safety committees throughout OPG and discuss existing and potential workplace hazards with a primary focus on how the parties can address these issues through the Internal Responsibility System.

Based on agreement of all parties, that is the management and worker reps, all joint health and safety members are certified members, a standard over and above that required by legislation.

Certified members have taken additional training and have special powers to halt unsafe work under the Act.

Also, over and above the legislated standards is the multi-layered nature

of joint health and safety structures at OPG. In addition to the joint health and safety committees, which exists at each work site in OPG, including the Western Waste Management Facilities, there is also a Joint Working Committee, or JWC.

The JWC is a tri-party corporate committee consisting of two management, two society and two PW members that operates at a higher level of analysis to identify issues and trends, evaluate evidence and solutions, and to recommend actions.

The JWC sponsors two related working groups; the Corporate Safety Rule Advisory Group and the Corporate Code Advisory Group, which are responsible for making recommendations for changes to the corporate safety rules and corporate work protection code respectively.

The JWC meets on a monthly basis, and consensus of the parties is mandatory for approval of joint policies.

The JWC functions to provide support and guidance and reports to the tri-party advisory committee, so the TAC.

The members of TAC are the presidents of the three tripartite parties -- Scott for Society and management and PWU -- whose personal involvement ensures that health and safety issues are dealt with through a hands-on approach up the highest level of all organizations.

Finally, the Society regularly participates in CNSC hearings and meets informally on a bi-monthly basis with the CNSC, which affords us yet another venue to make recommendations for systematic improvements to health, safety and environmental policies and practices.

In the event that a safety issue were unable to be satisfactorily resolved by the parties through one of the many available internal processes and structures, the Society would not hesitate to seek the immediate intervention of the CNSC and to use its powers under the *Nuclear Safety and Control Act* to take whatever measures were necessary to remedy the concern.

For all these reasons, the Society does not believe the incidents at the

Waste Isolation Pilot Plant impacts on the objective risks of the DGR and we support the proposal being made here.

MR. TRAVERS: Thank you, Andy.

In conclusion, we would like to thank the Joint Panel for allowing us to make the submission.

As Andy said, we strongly are of the belief that the evidence demonstrates that the proposed deep geological repository at the Bruce site is objectively the safest and lowest risk solution for the long-term storage of low and intermediate nuclear waste and the Society is confident that OPG has examined the events at the WIPP and extracted from the investigators' reports and conclusion the lessons that might be helpful or applicable to the Bruce DGR.

And, most importantly, we are prepared to state categorically that the sort of unacceptable design and operational practices and degraded safety culture that were evident at the WIPP do not and will not exist in OPG, the NWMO or any organization where the Society and its members are legally empowered to share in the responsibility for health and safety.

Thank you.

THE CHAIRPERSON: Thank you very much.

Dr. Muecke, Dr. Archibald, did you have any questions?

MEMBER MUECKE: Just one, going back to your submission.

You state that international experience has shown that both sedimentary rocks or granitic rocks are suitable for DGRs.

Which are the DGRs in granite rock that you are referring to?

--- Pause

MR. D'ANDREA: Andy D'Andrea.

I'm not aware of any repository in granite rock that's operating, but I believe that's a question more for OPG or the NWMO, but I am aware of studies that have been done in the past to investigate the functioning or the potential release in a vault situated in granite rock. So my understanding is those studies showed that no unacceptable releases would occur.

MEMBER MUECKE: Would you agree that studies are not the same as experience?

MR. D'ANDREA: Certainly, yes.

MEMBER MUECKE: So how would you restate the statement?

MR. TRAVERS: Scott Travers, for the record.

I believe the statement was that studies had indicated that granite would be suitable.

MEMBER MUECKE: Please look at your own submission.

THE CHAIRPERSON: Dr. Archibald...?

MEMBER ARCHIBALD: In your presentation you asked that decisions should be made to:

"...prioritize assessments of objective risk and promote an approach to dealing with often inaccurate perceptions of risk..."

Could you explain how OPG might go about correcting subjective perceptions of risk held by the public?

MR. TRAVERS: Scott Travers, for the record.

It's our belief that through

education programs and communication programs with the local public about the nature of the industry and of the hazards, that would lower the perceptive risk.

MEMBER ARCHIBALD: Does your Society feel that OPG has done a creditable job in doing such education to the local public?

MR. TRAVERS: We do believe that OPG has done an excellent job of making those kind of education and we do support the continued use of that kind of education program.

MEMBER ARCHIBALD: Another statement made in your presentation is concerning the degraded safety culture at the WIPP and that it occurs in part due to the -- such a degraded safety culture does not exist at OPG due to the presence of the internal responsibility system and adherence to occupational health and safety standards and practice. These exist at all workplaces and all worksites in Ontario and even though they do apply accidents still continue to occur at workplaces under such control.

Could you confirm why the OPG site standards are better than elsewhere and why the joint working committee system used by OPG

provides a much higher standard of adherence and presence and safety presence?

You had mentioned the JWC and certified members with extra training. Are these in part or are they other aspects? Could you just confirm for me, please?

MR. TRAVERS: Scott Travers, for the record.

So OPG does set standards higher than the requirements under the legislation so, as we spoke to, the joint health and safety representatives are certified and have extra powers, as a result they can stop unsafe work.

There is the use of the station condition reporting system which was discussed earlier this morning. So all employees have access to the station condition reporting system and they are encouraged to make reports on any variance no matter how minor, even something as simple as snow removal. Those condition records are tracked and reviewed and trend analysis.

There is a joint working system, as Mr. D'Andrea mentioned, through the advisory committees. All these additional processes above and beyond the requirements of the legislation

all lead to a higher safety standard and lower incidents.

MEMBER ARCHIBALD: One last question and this is just to your knowledge.

Does any similar system of oversight exist at the WIPP?

MR. TRAVERS: Scott Travers, for the record.

I don't have knowledge of the specific systems of the WIPP, no.

MEMBER ARCHIBALD: Fine. Thank you very much.

THE CHAIRPERSON: Thank you very much for your presentation.

Do you have something to add?

MR. D'ANDREA: Just on the first question.

So I believe in our submission we are speaking about the deep geologic repository as an acceptable solution which would not require institutional controls and then we referred to studies that were done showing that it would be acceptable in terms of no releases over time.

So we did not refer to any specific example of a repository in granite rock.

THE CHAIRPERSON: Thank you for that clarification.

Before we proceed to the next presentations, I understand that Dr. Thompson at CNSC has some more information for us

DR. THOMPSON: Patsy Thompson, for the record.

So, Dr. Archibald, you had asked questions about lessons learned from events at uranium mines and I had said I would look for information on whether fires had taken place.

So the answer is yes, there have been underground fires in uranium mines in the past. In most cases the fires were small due to hot work being performed. In most cases the underground procedure was activated, all workers responded in the appropriate manner. The workers were accounted for in refuge stations. The mine rescue team mobilized and responded to the event, checked the mine for any residual gases and declared all clear conditions prior to workers returning to surface.

In terms of CNSC staff follow-up with licensees, this type of event would be reported under section 29 of the *General Nuclear*

Safety and Control Regulations, so it's a reportable event. A notification is required within 24 hours and a report required within 21 days.

CNSC staff review of the event would include the root cause, the corrective actions and the lessons learned.

CNSC staff would verify corrective actions and implementation during compliance inspections to ensure that measures are actually put in place and are effective in preventing a recurrence.

THE CHAIRPERSON: Thank you.

Next on our schedule today are nine 10-minute oral presentations. We will hear from all nine of the presenters, the panel will ask questions, if any, after each presentation.

Questions from registered participants will occur after all nine presentations, time permitting. Therefore I would ask each of the individuals and groups making oral presentations this afternoon to remain available until the end of the session, if at all possible. Thank you.

So our first presentation, a

10-minute presentation, is from Jutta Splettstoesser.

Ms Splettstoesser, please proceed.

PRESENTATION BY / PRÉSENTATION PAR:

JUTTA SPLETTSTOESSER

MS SPLETTSTOESSER: Aanii, bonjour. Thank you for giving me this opportunity.

Dear members of the Joint Review Panel, I continue to participate in the hearing process because I would like to contribute a different perspective as well as valuable information.

In the last couple of weeks I have knocked on many doors because we are in a municipal election and I just wanted to share on a side note that of the hundred households, many of them that are direct neighbours to the proposed project site, are very concerned.

At the hearing last year the Joint Review Panel had brought up the question about first responders and available facilities

for the community for contaminated humans. I have described to you in my submission how long this process was. Again, I was really surprised that I had to take -- basically, it took me nine months to have access to this document. The document is the Memorandum of Agreement with Bruce Power and the South Bruce Grey Health Centre.

My question is: Why does it take nine months for the initial information request to read -- why does it take so long to answer the questions.

So the Memorandum of Agreement between Bruce Power and the hospital was signed October 2011 and it stated:

"... that an annual drill and walk-through should happen to prepare for a real incident."

And maybe this is the German heritage that we have. The first question today from Dr. Muecke was about the frequency of drills.

I know I am concerned as wanting to serve my community in the future, I am very concerned about safety. I am concerned about

agreements, follow-up and the process. If there is a process in place, I was surprised to learn that we only had one drill in the last three years.

So you wonder: Well, what does that have to do? Well, OPG has hired Bruce Power for the emergency management of the Western Waste Management Facility. I haven't really described it, but I had also reached out to Scott Berry from OPG in the process to get some information and he had confirmed that it was not -- like that Western Waste Management Facility for emergency response Bruce Power is responsible. That's my understanding.

If this is the same case for the current proposed deep geologic repository, can citizens expect a higher level of accountability and also execution of plans that are in place for any potential risk around nuclear waste management?

On the WIPP I just want to make a few comments. We really don't know what happened seven months ago, that's what we were basically told this morning.

Last year CNSC and OPG used the

WIPP as the poster child and, by the way, the same posters that they used two years ago are still hanging in the public local offices from the Nuclear Waste Management Organization. They have not replaced the posters. There is no information about any incidents on their poster.

When they go in the community, when I ask they will talk about some problems at the WIPP, but really now we are looking at all the different deficiencies. But so my husband and I, we listen to the Carlsbad online in disbelief.

We had a friend from Germany visiting, she thought, "This can't be true. They are just talking about a filter change. Should that not be done before?" But I know we cannot always -- we don't know what could happen. Those are risks that we are taking.

So how can the public engage and participate meaningfully if we don't know what happened?

Are we prepared for the unexpected?

And I don't have to go any further. I just want to give you a little note

about Schacht Konrad. I am connected to a farmer, just like I am in Schacht Konrad and I will go and see them in November. I am in frequent contact with the people that are really caring for their project, and they gave me a brief summary about their project that is under construction in Germany. This was described to me in German, I just summarized it a bit. They are dealing with not foreseeable problems during construction.

The struggle is to meet the scheduled timelines for construction. That already basically results into a licence extension application.

New cost overruns are recently announced. The minimum estimated cost was 3.3 billion Euros, which translates approximately to \$5 billion.

It is also becoming evident that the facility do is not large enough to house all the waste that it should be accountable for.

Let's take away the following question from the German example:

Who is responsible for the quality control of the workmanship during

construction?

How do we guarantee a regime of the highest level of safety measures over company profits?

Is it possible to tie into licensing process more stringent requirement and safety measurements?

My conclusion. My experience with various partners in Kincardine proposing the DGR does not give me confidence to trust in the validity of the proposed project. Please recognize the risks of the unknown.

In my opinion, the environmental assessment is incomplete and insufficient. The currently applied safety standards are not in our best interest from a human perspective and for future generations.

I asked the Joint Review Panel to deny OPG's licence application for the low and intermediate level waste DGR in Kincardine.

Meegwetch. Thank you very much for the opportunity.

THE CHAIRPERSON: Thank you.

Dr. Archibald, Dr. Muecke, did you have some questions?

Dr. Muecke...?

MEMBER MUECKE: My question goes to OPG.

Does OPG have readily accessible information for the public regarding emergency preparedness applicable to human contamination by a radioactive release either in their workforce or the public?

--- Pause

MS SWAMI: Laurie Swami, for the record.

I will ask Mr. Powers to also come forward in case he can provide more insight than I can.

The DGR facility does not -- we don't predict that the effects would result in contamination of the public -- that's not what we have predicted -- and as a result doesn't fall under the emergency plan that you would think of for the large operating facilities that we have.

The emergency planning process, part of our requirement is to provide information, or at least support the provision of information to the public through the appropriate emergency management offices. For instance, in

our Durham area where we have our large nuclear facilities, material is provided to the public on what to do in the event of a nuclear emergency, the unlikely event of a nuclear emergency. That information is provided by Durham Region. There is also information provided on the nuclear emergency plan that's published by the province.

We provide information on our website also regarding emergency preparedness, but it is the responsibility of the municipalities where we operate to provide that information to the public and we provide support and ongoing information as well to the public.

But I will ask Mr. Powers to provide more information if that's helpful.

THE CHAIRPERSON: If I could supplement just to help Mr. Powers, there's a very specific question arising out of Ms Splettstoesser's experience and so this is how I would like to phrase it. How does OPG coordinate with Bruce Power regarding answering questions such as those from Ms Splettstoesser in a timely manner such that she doesn't have to wait for nine months for an answer for what seemed to be a fairly straightforward question.

MR. POWERS: Kevin Powers, for the record.

When it comes to requests from the public, we endeavour to follow at the bare minimum the provincial standard for responding to inquiries from the public. The provincial standard is about 30 days for response to the public for any of the correspondence units from government ministries and that's what we do endeavour to achieve.

With regards to Ms Splettstoesser's request to Bruce Power, we did not co-ordinate with them on that specific request, but she did mention she was in contact with one of the folks at Ontario Power Generation to better understand how we do that and so we are in contact and do try to do what we can to help the public with requests.

THE CHAIRPERSON: Mr. Powers, as a follow-up, based on this most recent experience, is there any lessons learned in terms of the need for co-ordinating between OPG and Bruce Power to make sure things don't fall through the cracks when obviously, especially in the aftermath of an incident such as WIPP, one

can anticipate these types of questions? So the Panel would appreciate it if you had in fact applied some lessons learned here.

MR. POWERS: Kevin Powers, for the record.

We understood as soon as the WIPP event happened that it would be of concern to the public and we did act very quickly on that, within a few -- once we had a better understanding of the incident itself, we sent out a note to all of our stakeholders who were on our list to find out more about the Deep Geologic Repository.

We followed that up with an ad in a local newspaper to talk a bit more about the incidents and what we knew about them.

We followed that up with a two-page insert in our quarterly newsletter to all of the residences around the area to talk about both incidents, what we knew about them.

In addition, we added that material to our website as well as Qs and As on the incident.

THE CHAIRPERSON: Again, to OPG, would you know why there's only been one drill

executed in the last three years?

MS MORTON: Lise Morton, for the record.

So I did follow up with Bruce Power, understanding that this might come up and, again, understanding that Bruce Power is the one that holds the Memorandum of Agreement with the Kincardine Hospital.

What was indicated to me, and I understand was responded to Ms Splettstoesser back in June of this year, was that the formal agreement with the Kincardine Hospital was signed in late 2011 and that 2013, the drill in the 2013 was set up and a review of the personal protective agreement. And then they are preparing for the 2014 drill in the months of September and October of this year with a rollout to hospital staff and then a drill occurring in the months of either September or October and that they're on track with those current preparations.

That is the information I was able to obtain from Bruce Power.

THE CHAIRPERSON: And, finally, a follow-up for the CNSC.

What does the situation described by Ms Splettstoesser tell you about the state of communications in emergency preparedness between Bruce Power and OPG and from there to the public?

DR. THOMPSON: Patsy Thompson, for the record.

If you'll allow me, Dr. Swanson, I would come back after the break with that information. I don't have anyone who can help me with that answer right now.

THE CHAIRPERSON: That would be helpful. Thank you.

Dr. Archibald, did you have any further questions?

Thank you very much, Ms Splettstoesser. And as I said, if you could remain available for later that would be most appreciated.

--- Pause

THE CHAIRPERSON: I apologize for the delay. There was a bit of confusion about where the other Northwatch presenters were. It turns out they are on the phone.

So Ms Lloyd, please proceed.

PRESENTATION BY / PRÉSENTATION PAR:

**ONTARIO CLEAN AIR ALLIANCE, ANGELA BISCHOFF WITH
DON HANCOCK, NORTHWATCH AFFILIATE**

MS LLOYD: Yes, thank you. And good afternoon, Dr. Swanson and Panel Members. My name is Brennain Lloyd with Northwatch.

And Northwatch and the Ontario Clean Air Alliance jointly retained Don Hancock from the Southwest Research Information Centre to do our expert review on events at WIPP and the relevance of those incidents to the DGR proposal.

We have Angela Bischoff from the Ontario Clean Air Alliance and Mr. Hancock on the phone to present. We will begin with Ms Bischoff.

My job is to move the slides.
Thank you.

Angela...?

MS BISCHOFF: Thanks, Brennain.

And hello and thank you to Members of the Joint Review Panel and greetings to the public as well. I'm calling in from Edmonton.

As you know, in February of this

year WIPP's technology failed releasing plutonium and other deadly radionuclides into the environment. Even though the failure occurred more than 2,000 feet below ground, more than 20 workers suffered radioactive contamination aboveground. And again in March there was a surface radiation release, almost twice the levels released in February.

It took just 15 years for the WIPP technology to fail at a site designed to isolate radioactive waste for 10,000 years.

Furthermore, costs for WIPP prior to the release in February had skyrocketed from \$450 million to over \$5 billion and were expected to rise over \$9 billion. Of course, the public is always left holding the bag.

Investigations are underway at WIPP but we still don't know what went wrong or what is still going on, partly because federal officials are impeding the state's investigation, according to New Mexico's top environmental regulator just last week.

The failure of the WIPP technology is not unlike two other deep underground radioactive storage dumps, the Asse

II salt mine and the Morsleben dump, both in Germany and both leaking. The waste at Asse II must be retrieved and stored elsewhere, still to be determined at enormous expense and it will take decades. Meanwhile, the Morsleben dump is threatening to collapse. And closer to home, the Yucca Mountain in Nevada after spending \$8 billion the project was cancelled due to unexpected groundwater seepage.

Will OPG's DGR be Canada's Yucca or Asse II or Morsleben?

OPG modelled its DGR design on WIPP and WIPP failed after just 15 years to protect the environment and its workers. The WIPP case and others demonstrates the high-stake risks associated with DGR projects.

To conclude, we must reject OPG's DGR project and instead implement HOSS, or Hardened On-Site Storage technologies that are monitored, retrievable aboveground and onsite and cared for using a policy of rolling stewardship until a genuine fail-safe solution is found while at the same time aggressively reducing waste at source by committing to a complete nuclear phase-out when our existing reactors come to the end of

their lives.

Thank you for hearing my brief presentation.

And I'll now pass the mike over to Mr. Hancock who has been following this issue at WIPP closer than almost anyone.

MR. HANCOCK: Thank you. My name is Dan Hancock.

I appreciate, Madam Chair and Members of the Panel, and the opportunity to speak to you again as I did last year. This time, of course, I'm speaking from Albuquerque, New Mexico.

Thanks to Ms Bischoff for reducing her presentation time and to Ms Lloyd for assisting with the slide presentation.

I am watching online and it appears to me there's about a 15-second delay between what I'm saying and hearing and what I'm seeing online. So please bear with me as we go through the slides.

When I appeared before the Panel on September 23rd, 2013 a number of issues were addressed in relation to information that OPG and CNSC had not considered about WIPP and you Panel

Members had a number of good questions in that regard back then.

Given the relevance of the WIPP fire and radiation release, Northwatch and Ontario Clean Air Alliance asked me to prepare a report which is document 19-56 reviewing the OPG and CNSC reports about the fire and radiation release discussing some of the missing information, providing additional information and suggesting questions and noting initial lessons.

So let me briefly talk about some of those things. I have been watching during the day and I will try not to repeat items covered by OPG or CNSC this morning.

So the next slide, I want to start with what is a basic fact from my 2013 report that has only been confirmed by incidents since then. The basic fact is that there is not yet one example of a DGR that has successfully operated to fulfil its mission of safely isolating the waste from people and the environment for the thousands of years that they are hazardous. And so that was true at the time. And, as Ms Bischoff mentioned and I mentioned in my testimony about the two German repositories,

WIPP now makes it all three long term operating deep geologic repositories that have had significant failures during their operational lifetime.

So the international experience demonstrates that there are many uncertainties and that experience does not establish that a DGR can be successfully operated and decommissioned. Plus, a basic challenge for a Canadian DGR if licensed and operated would be for it to be the world's first successful repository.

Now, going on to the next slide you've heard about the fire and seen some pictures including the burned salt truck. So I'd like to go to the next slide, slide 4, which talks about the results of the fire. And I want to focus on the third point and the fourth point.

One of those 13 workers treated for smoke inhalation is still being treated and has claimed total disability. He has filed a lawsuit against present and former contractors.

I appreciate the fact that the Chair asked earlier about whether this could be confirmed or not. It can be confirmed in numerous ways in addition to my written

submission. The WIPP recovery website has a section called "Frequently Asked Questions" and it specifically says, and it has for a couple of months:

"Six work personnel were evaluated for smoke inhalation and released from a local hospital the day of the underground fire. One employee continues to be treated for smoke inhalation as a result of the fire."

So subsequently that worker, Mr. Utter, has filed a lawsuit raising numerous claims which obviously haven't yet been adjudicated by the court. But if the Panel is interested, I could also provide a copy of his complaint.

The next point is that as a result of the fire all of the continuous air monitors underground were out of service for six days. So if the radiation release had occurred during that time rather than nine days after the fire, the worker and public exposures would have been much worse because the filtration system

would not have gone into operation as it did go into operation as you've heard on February 14th. So this is a significant factor that should also be considered.

The next slide -- the next slide just shows a picture of the fire coming off the salt shaft at the WIPP site. That was one shaft that was affected, one of the four WIPP shafts that was affected by the fire.

The next slide looks at the waste hoist which has been out of service now for seven months and it's still out of service because of the smoke and the fire. So the fire had significant -- created significant difficulties for the site.

Moving along to the next slide this just is a graph that shows the relative locations of the two events and the fact that the radiation release occurred more than 700 meters from where the fire occurred.

So let's go on to the next slide.

So a fundamental fact that's very important in all of this, and I would ask it also be considered in the context of the DGR is that this event was never supposed to be happen. WIPP

was supposed to start clean and stay clean and it did not. As has been stated already the causes, the cause or causes are unknown now seven months after the event. Importantly, it's not known whether future events can be prohibited or prevented or not.

I guess an additional fact I want to make sure that didn't seem to me to be clear from earlier discussions today, Room 7 of Panel 7 where the release occurred had just started being used about three weeks before the radiation release. There were 258 containers in the underground. It was an early release in terms of that area and it was from -- in comparison to the number of containers in the facility, a very small number that were directly affected.

The next slide shows the fact as a visual as part of the failure of the radiation control system, the ventilation and the filtration system that did allow radioactivity to be released.

Moving on to the next slide, though, let's focus a little bit more on that the worker radiation control system failed.

You've heard that 22 workers had

internal contamination. The earliest, the fastest any worker was notified of that contamination was 12 days. Four workers were first told they weren't contaminated and then were subsequently confirmed to have internal contamination. One worker it took almost three months before being notified that they were exposed. So to me this is a very significant failure of the whole system.

Moving to the next slide, it wasn't just the workers that were misinformed. The public was misinformed and the public radiation protection also did not work correctly.

DOE stated on numerous times on February 15th and 16th that there was no contamination on the surface, there was no risk. And in fact, the public was not informed that there had been the external radiation release until four and a half days after the release on February 19th by the Carlsbad Environmental Monitoring and Research Centre which is an independent monitoring entity for WIPP that first disclosed that there were releases that their air monitors showed to the extent of a mile away from the exhaust shaft where the ventilation goes out

into the environment. So that far away they found WIPP waste -- particles from WIPP waste of americium and plutonium.

So the public had to find out about the release not from DOE and not from its contractor but from the independent monitoring group.

If we go to the next slide that has continued to be a problem. CEMRC has continued to provide detailed technical information, actual radioactive readings when -- in cases that the Department of Energy does not which is one of the problems from my perspective, and I mentioned in my report, of OPG and CNSC just relying upon DOE and its contractors for their sources of information.

Moving to the next slide, as I mentioned earlier, the Department of Energy had no plans to deal with the decontamination that we have now at the facility and so what that meant is that the options that are currently available in terms of what to do are limited. I think there are really only three and none of them are actually very good in their own right.

One is to close the facility up

and not accept any more waste and decommission the site. Obviously, that's eventually supposed to happen but not now.

A second option would be to reopen the contaminated mine and putting workers in a situation of having chronic exposures because the underground cannot be completely decontaminated so workers would be subjected to chronic radiation and toxic chemical exposure.

Or the third option is to reopen the site while substantially redoing it so that part would remain contaminated in part and somewhere or another would be redone and declared clean.

The Department of Energy has not provided a public plan about what it intends to do.

But it appears, if you go to the next slide, that they are likely to do that third one, that clean and dirty approach, because they are talking about -- they have stated publicly and ask our Congress to provide funding for a new exhaust shaft and a new ventilation system because the current ones are so contaminated that it's not possible to reuse them. The cost of

these new systems are unknown. The timeframe to construct them is unknown. Whether they'll work is unknown. Whether additional changes are -- would be needed are unknown. So this again is -- leads to great uncertainty.

So if we go to the next slide, some of the lessons that therefore that leaves us with, which I think should be considered as I'm sure you are, you've heard that both WIPP events were below criteria. They've been assessed for the DGR.

In the case of WIPP we now know, however, that below criteria events can disable a repository. WIPP has disabled the official -- there is no schedule for when WIPP would reopen. The Department of Energy has informed the State of New Mexico the earliest possible date for even minimal getting back into compliance with the regulatory requirements is January of 2016. In other words, the facility would have been out of service for two years at that time and to get into operation will of course necessarily take longer than that as well. But again, we don't know how that can or will have occurred.

Another clear lesson from this is

that repository operations are more complex than surface storage. Over the last 15 years that WIPP has been operating, the transuranic waste that is now in the underground at WIPP and additional transuranic waste that is at the storage sites around various sites around the country have not had any way near as serious an event as what WIPP had in the underground.

And so while there has been a lot of discussion about safety culture which I'll get to in a minute, I think based on the experience that we've now had with WIPP, we need to take seriously the fact that underground repositories are in fact more complex than surface storage and, in addition to being -- dealing with mine issues and radiation safety issues, the combinations thereof clearly have created unanticipated problems.

And I spent some amount of time in my presentation last year talking about what is in my view a root cause of the declining safety culture at WIPP which is for the last several years the Department of Energy and its contractors have been very interested and spending time, effort and money on proposing new

and expanded missions for WIPP rather than focusing on the safety culture.

I raised this issue not only with the Panel last year but for longer than that I've been raising it with WIPP officials but, unfortunately, we've seen the results of that.

I think I will conclude because it looks like my time is about up. But I would be glad to respond to questions. Thank you.

THE CHAIRPERSON: Thank you, Ms Bischoff and Mr. Hancock.

Panel Members, do we have questions? Dr. Archibald...?

MEMBER ARCHIBALD: Yes, if I may.

Mr. Hancock, you stated in your presentation that the underground radiation monitors were put out of service for six days after the conventional fire event. Is the cause of the deactivation known? Was the fire -- was the fire event affecting the power distribution system that controlled these monitors?

MR. HANCOCK: So the source of the radiation monitors being out of service is both the DOE's on report and the Defence Nuclear Facility Safety Board report. Neither of them

have identified the cause of why this happened, so I, of course, don't know either.

In terms of the electrical problem that you referred to, it appears that that in some way or another wasn't at least a total cause because the monitor -- one of the monitors was able to be back in service before February 14th. Three other monitors were out of service, apparently unrelated to the fire.

MEMBER ARCHIBALD: All right. And a follow-up on that then also, and this is from the fire event, you indicate that:

"The fire residue and the soot from the fire went through the salt, waste and exhaust shaft..." (As read)

This is from your written presentation:

"...with the waste hoist being made inoperable due to a need for cleaning."

(As read)

My question is, what is the source for this conclusion and knowing the fact that most mines operating diesel equipment have a

continuous soot passing through a ventilation system that never causes a blockage, why would the ventilation exhaust shaft have to be closed because of the soot created from a fire event?

MR. HANCOCK: So the exhaust shaft -- the major problem with the exhaust shaft, of course, at this point nine days after the event, was because of the radiation release and the reason that DOE has now said they'll have to replace and have a new exhaust shaft if WIPP is to re-open is because of the radiation release, not because of the fire.

The waist hoist on the other hand, and I showed a picture in my PowerPoint slides, was and is still out of service and going through a cleaning process.

They are now -- related, Dr. Archibald, to what your earlier question was, they are now working on the underground electrical system related to the waste hoist because there are concerns that there are problems with it as well.

But the hoist has not been able to be used -- again, not speaking to the Canadian experience which I don't know and you do know --

but since the fire was not supposed to happen, there weren't ways in the WIPP system to, as it turned out, to contain the smoke, that's why it went in areas it shouldn't have gone, like at the exhaust shaft, or I'm sorry, out of the waste shaft and out of the salt shaft, as I also showed a slide of.

MEMBER ARCHIBALD: I believe that and due to some management issues there were many problems created.

And on page 8 of your written presentation you mention that:

"Two bypass dampers were not designed to fully close and did not fully close, thus allowing radioactivity to bypass the filtration system." (As read)

Could you clarify for the Panel whether the dampers were designed not to fully close, or were they poorly engineered and did not close fully as they were supposed to?

MR. HANCOCK: According to what has been stated by both DOE and their contractor, it was actually a design requirement, or a design

result as opposed to an operational failure.

Again, they never presumed that the filtration system would really have to work, and so the fact that they closed but didn't fully seal was not thought to be a design problem, so they were aware of it. And so, once the radiation release happened, they knew that they needed to go in and seal them, so they had workers go in with a foam sealant to seal up the crack that remained in terms of closure but not full sealing.

So the design did not have a full seal on those dampers, so -- and that was known, and so, again, my understanding of what they're talking about at this point is that the new exhaust shaft and the new ventilation system they would design would, in fact, be designed to have seals, but it was a design flaw.

MEMBER ARCHIBALD: Could I ask, in your opinion, why would the shaft and ventilation system be required to be replaced; is this because of over contamination above the design limits or is this simply as a precaution?

MR. HANCOCK: I think it's the former. It would be very difficult and, again,

there's no example in the world that I'm aware of, of trying to decontaminate a 2,150 foot vertical shaft. Putting workers there and trying to do that would be very difficult. The ventilation system itself is very contaminated.

Again, we don't know -- it's important to emphasize, we don't know the amounts of contamination because there haven't been and there isn't monitoring, there hasn't been sampling done as far as we know and certainly no results have been made public of the levels of contamination in the exhaust shaft.

The eastern most drift where the radiation system -- where the ventilation system takes the contamination to the exhaust shaft, that's called the East 300 Drift, hasn't -- there's been no sampling done there; so we, in fact, don't know exactly the levels of contamination that there are in those places, but it's been -- by independent experts I've talked to and in talking to the DOE headquarters site manager and contractor people, they all are quite willing to agree that they cannot decontaminate fully the exhaust shaft and the ventilation system and that's the reason they would need a

new system and a new exhaust shaft.

MEMBER ARCHIBALD: Is this a firm conclusion of DOE? Has it been published or sourced anywhere? And, for example, they have four shafts operating at the WIPP; one has been used as an exhaust shaft, could one of the other three operating shafts be re-purposed as a ventilation exhaust shaft?

These are concepts that have not been made public, but has DOE, in fact, sourced the reason for the closure and a plan for re-purposing or reconstructing a new shaft, to your knowledge?

MR. HANCOCK: So, what they call their recovery plan that is supposed to put into great detail what they have to do to get in operation, including the new exhaust shaft and the new ventilation system and many other things, is not yet public.

The dates that it will be made public are constantly changing. September 18th, at a town hall meeting in Carlsbad, they've promised the plan would -- they would begin discussion of the plan, but they've also stated that the actual plan would not be released by

September 18th. So we don't know when it's going to come.

In terms of the source of -- among the sources for the need of a new ventilation system and a new exhaust shaft is the United States Congress which, at DOE's request, has included money in public documents but haven't yet passed the Congress, but have come out of the Appropriations Committees, have specifically stated that they're starting to put money out for WIPP for a new exhaust shaft and a new ventilation system because they've been told by DOE that it is required, as I say.

And I understand it's not the document that you're looking for which is hopefully this recovery plan that's coming out, but I've had personal conversations with the cognizant officials asking them publicly at, for example, these town hall meetings whether the recovery plan includes the requirement for a new exhaust shaft and a new ventilation system and the answers have been unequivocally yes, we are required for them.

So the issue of re-purposing other shafts, this was an issue -- and I did

mention it in my testimony last year -- this was an issue of reducing the number of shafts was considered in the 1980s when WIPP was under construction and the idea of going with three shafts and re-purposing them was rejected at that time.

I think you are correct, Dr. Archibald, and I have suggested as well, that there ought to be a comprehensive look at what the options are in terms of doing what needs to be done, but so far we don't have documents and we don't have a process to do that yet.

MEMBER ARCHIBALD: Thank you. And just one last question. This is not to you, sir, but to OPG. This is based upon a statement of Mr. Hancock's on page 14 that:

"Given the WIPP design, which is being generally followed by the DGR, an underground radiation release can contaminate a much larger area than what has occurred with surface waste."

(As read)

Would OPG care to comment on that

statement?

DR. GIERSZEWSKI: Paul Gierszewski, for the record. Sorry, you said page 14?

MEMBER ARCHIBALD: I'm uncertain whether that's page 14 when I have my pdf document open or whether it's actually page 14 written.

DR. GIERSZEWSKI: Well perhaps, could you just read the sentence again to me, just to...

MEMBER ARCHIBALD: Yes, I can.

"Given the WIPP design, which is being generally followed by the DGR, an underground radiation release can contaminate a much larger area than what has occurred with surface waste."

(As read)

Knowing the conclusions that DOE has come up with about re-doing shafts and so on, would you care to comment on this statement?

DR. GIERSZEWSKI: Paul Gierszewski, for the record. So I guess there's

a couple of points here. I mean -- and so in this case here that underground release has contaminated a large portion off the repository, the downstream ventilated area and the shafts and that's a significant area of their facility.

We understand that the release levels at surface were low, below the environmental criteria, but underground they're contaminated.

Now, if we had -- if that same release occurred at surface, now we're into the hypotheticals here, but if it was in the building that did not have filters or did not have HEPA filters, again, I don't know what the structure would be. If these waste containers had been in an open location, I guess I wouldn't speculate as to what that area would be, but it's not immediately obvious that that would be -- that you wouldn't have equivalent surface contamination depending on the nature of how these containers were stored at surface.

MEMBER ARCHIBALD: Allow me to rephrase also then. Given the WIPP design, which is generally followed by DGR, the purpose here is that the two are assumed to be similar, would a

breaching event at the proposed DGR give a similar conclusion for radioactive contamination downstream through the exhaust ventilation shaft and through the networks with such severe repercussions that's been shown at the WIPP?

DR. GIERSZEWSKI: Paul

Gierszewski, for the record. So if there was a release in a container at the proposed DGR design, until you stop the ventilation you would get, indeed, the distribution of the radioactivity down the downstream tunnels and into the shafts, so we have the same type, the same pathways.

But the important point I think is that the types of waste that we have in the DGR are different in nature than the types of waste that we had at WIPP.

So again, while we don't know exactly what was in the container so I can't speak definitively, I would expect that the level of contamination in the DGR would be lower than that in WIPP.

MEMBER ARCHIBALD: Thank you.

MR. WILSON: Sorry, Dr.

Archibald. Derek Wilson, for the record. I

think there's some other fundamental differences in terms of the DGR design with respect to the flow of ventilation air through the repository and to the surface facilities.

You would not see a return of airflow in through the head frames and into the existing hoisting operations. The design of the ventilation airflow is such that it's released below that through a plenum and directed away from the operating facilities of the DGR.

So you would not have the same level of flowthrough in that particular case because, again, it's directed through. However, that would be similar to that of WIPP in terms of the HEPA system, but again, it's directed through and then released directly to surface through the plenum.

THE CHAIRPERSON: I'm looking at the time and thinking that we're due for a break unless, Dr. Meucke, did you have a very brief question so we can let Mr. Hancock and Ms Bischoff leave the phone?

MEMBER MUECKE: I'm not sure how brief they're going to be, but we can try.

THE CHAIRPERSON: Well, in that

case I think we better take a break because it's already two hours into this and, I don't know about you guys, but I need a break.

So let's reconvene at, promptly though, at a quarter after 4:00. So if Mr. Hancock and Ms Bischoff could bear with us and we'll reconvene then.

Thank you.

--- Upon recessing at 4:03 p.m. /

Suspension à 16 h 03

--- Upon resuming at 4:16 p.m. /

Reprise à 16 h 16

MS MCGEE: Good afternoon. If we could resume, please. I will make another brief announcement. I want to acknowledge that at approximately 2:05 today we experienced some technical difficulties and the webcast was temporarily not available. I understand the webcast resumed at approximately 2:15 and I just wanted to note for everyone interested that while you were not able to follow that 10 minutes as live access, the archived version of today's webcast will be complete without that 10-minute

gap.

Thank you.

THE CHAIRPERSON: Okay. So we're now going to resume questions for the previous presenters.

Dr. Muecke...?

MEMBER MUECKE: Mr. Hancock, are you there?

MR. HANCOCK: Yes, I am. Thank you very much.

MEMBER MUECKE: Okay. You note that some of the WIPP personnel on site were allowed to leave as being uncontaminated, but later tests indicated that they were actually exposed.

What was the delay and the length of the delay between the two decisions; and, secondly, can this be attributed to negligence or was it due to differences in the sensitivity of the detection method used?

MR. HANCOCK: So the delay occurred between February 14th and 15th, the releases, and the morning of the 15th when the sheltering in place happened, as has been mentioned, and February 19th when there was the

public acknowledgement that I mentioned in my testimony about the release.

I have asked the question you just asked numerous times to DOE and other people. I've expressed my concern that the accident investigation Board report, Phase 1 that was referred to this morning by both OPG and the CNSC, did not discuss the whys for that. So we don't know.

I have also had the discussion with Dr. Russell Hardy who's the head of CEMRC, the organization that I mentioned in my presentation, did a much better job of detection and public disclosure, and he had some ideas, but he's not sure either what the problem was.

So we don't know the answer to that very good question. It's one of the kinds of things -- one of the many unanswered questions that we need to have better answers to going forward in terms of lessons learned and changes that are needed.

MEMBER MUECKE: Okay, thank you. That brought you to CEMRC, is that the right way of pronouncing it, CEMRC?

MR. HANCOCK: CEMRC, yeah, that's

the way the acronym is.

MEMBER MUECKE: Okay.

MR. HANCOCK: C-E-M-R-C.

MEMBER MUECKE: The Carlsbad Environmental Monitoring & Research Center. And you mentioned that they picked up off-site contamination which apparently was not detected by the government agencies. Is there any explanation for that?

MR. HANCOCK: Well, again, one of the things that the lessons learned from a public standpoint is that the detection systems that the Department of Energy and its contractor were using were insufficient.

I mentioned in one of my slides and in the presentation they've actually now established additional monitoring sites, both air and otherwise and CEMRC has also established some additional monitoring sites.

So no, we don't know the answer to the question other than -- and, again, a point I want to emphasize and think it's -- I don't know the Canadian system, you all know it better than I, but the U.S. experience has been, the government and the corporate contractors are not

always the best sources of accurate information and my organization was one of those that argued from the beginning that there should be independent monitoring of WIPP and experience shows that that was correct.

MEMBER MUECKE: Thank you.

Perhaps I can ask you some questions about CEMRC. Who set it up initially and why was it set up?

MR. HANCOCK: It was set up to provide independent monitoring of WIPP. They both monitor the WIPP site, they have whole body counts that they do that they allow the public to come in, workers and public to come in at any time.

The idea was, it was set up in the 1990s before WIPP opened. It was set up to provide both background levels of radioactivity before WIPP ever opened and to provide workers and the public an independent source of radiation detection information and monitoring and it was set up, as I mentioned in my previous answer, because my organization and a lot of other people from the beginning thought that it was important, given the context of the U.S. system, nuclear weapons, which I understand is different than

what OPG is doing, commercial power rather than nuclear weapons, but a lot of us felt very strongly that we needed to have this kind of independent monitoring and so it was -- frankly, it was citizen advocacy that got CEMRC set up.

MEMBER MUECKE: Could you tell us who finances it?

MR. HANCOCK: Yes. The Department of Energy is required to provide funding for it.

MEMBER MUECKE: Thank you.

THE CHAIRPERSON: Thank you. I think that concludes the questions that the Panel has.

MR. HANCOCK: Dr. Swanson, may I make one more statement?

THE CHAIRPERSON: If it's going to add additional information, certainly.

MR. HANCOCK: So one of the things I intended to mention when I talked about the fact that this event was never supposed to happen is, one of the reasons it was never supposed to happen is because the waste acceptance criteria prohibit ignitable, reactive, corrosive or flammable materials at WIPP and this

came to mind this morning in the discussions that you had and the questions you asked about -- appropriate questions you were asking about the waste acceptance criteria for OPG and DGR, but we don't know yet exactly, as everybody has affirmed, about what the cause or causes of the WIPP accident were, but it appears that it could also have been a failure of adherence to the waste acceptance criteria.

THE CHAIRPERSON: Thank you very much, Mr. Hancock. That was helpful.

All right. I understand the CNSC now has an answer for us on the emergency preparedness notification issue.

DR. THOMPSON: Patsy Thompson, for the record.

The information I have is on the system in place on the Bruce site where you have two licensees essentially, Bruce Power and OPG. In developing emergency preparedness and response plans there are a number of assessments that are done through safety assessments and other tools. From those tools, the Western Waste Management Facility, in their safety assessment, identified that the worst case credible scenario for looking

at the need for emergency preparedness was one of the storage buildings catching fire and having a release. Their credible worst case scenario does not result in an off-site release that would trigger an emergency response notification to the province, so in the case of OPG there's essentially no situation that would require a notification to the province and off-site authorities.

In the case of the Bruce nuclear power plant, there is a series of events and accidents that have been assessed with potential off-site consequences. That is the basis for the emergency management program around the Bruce site and some of those situations would result in an off-site consequence and notification to the province. On the Bruce site, of the two facilities, the facilities that have a potential for off-site release and off-site accident resides with the NPPs, Bruce Power, so of the two licensees, the coordination between on-site and off-site resides with Bruce Power essentially because they have the types of accidents that could result in a situation with an off-site release.

On-site, Bruce Power and OPG will notify each other of events or accidents that would affect each other's employees essentially and site operations.

THE CHAIRPERSON: Dr. Thompson, perhaps the CNSC could remind the panel, in the proposed licensing requirements did you have any recommendations with respect to the proposed DGR should it be licensed in terms of having its own emergency preparedness and notification system?

DR. THOMPSON: Patsy Thompson, for the record.

Through the EIS and the licence application. Through the EIS there are a number of scenarios that were looked at for site preparation, construction and operation for potential accidents, malfunctions and malevolent acts. For those, at the time when radioactive material would be starting to be handled, it's through the operating licence phase. Accidents and malfunctions were identified requiring the provisions for emergency management and response plans, but having an on-site program where the requirement to deal with releases and potential impacts to members of the public is different

from the provincial nuclear emergency plan that the intervener was speaking about, so for the Western Waste Management Facility and the proposed DGR, there's no situation that would trigger the provincial nuclear emergency plan.

THE CHAIRPERSON: Thank you.

I think we can now proceed with the next presentation, which is a 10-minute presentation by Mr. John Mann.

Mr. Mann, please proceed.

PRESENTATION BY / PRÉSENTATION PAR:

JOHN MANN

MR. MANN: Thank you, Dr. Swanson, thank you, Dr. Muecke, and thank you, Dr. Archibald. I thank your staff for setting me up here today, their assistance.

OPG's safety case for its DGR lives and dies with the WIPP DGR since the WIPP DGR failed miserably on February 14. It remains closed now, seven months later. After an intensive investigation, they still don't know why or how the WIPP DGR produced a catastrophic radiation leak. Therefore, and as a result,

OPG's safety case dies with the WIPP DGR disaster.

My name is John Mann. I'm a citizen of Saugeen Shores and I'm a citizen of Bruce County where this proposed DGR is proposed. My family has been in this community since the 1800s. My friends, family, neighbours and colleagues support the some 3,000 pages that I've filed with this Joint Review Panel.

I'm a criminal lawyer. Forty years ago in January 1974, when I entered Detroit College of Law and entered my legendary professor's classroom, Professor Harold Norris, he wrote a phrase on the chalkboard in big, bold letters: DUE PROCESS. Since that time, I've had the good privilege and high honour to work for a Wayne County circuit judge in Detroit, the trial court in the state of Michigan, a court of appeal, a Michigan Court of Appeals' judge in Detroit, and for two years I worked for a United States' district court in Detroit, the federal trials court. That's where I learned due process and got educated to the highest degree from three judges who I, somewhat biasedly -- who hired me -- think are the greatest judges I've ever known.

Since that time I have had the distinct pleasure of working in all levels of courtrooms in Michigan, the district court, the circuit court, both trial courts, the Michigan Court of Appeals, the Michigan Supreme Court. I've worked in the United States Federal Court system, the district court, the trial court, the Sixth Circuit Court of Appeal in Cincinnati, Ohio. I've attempted to get *certiorari* two times from the United States Supreme Court. Unfortunately, they denied leave.

I came to Ontario and became a member of the bar here in 1993. I practice only criminal law. I had the good fortune of practising with a wonderful group of criminal lawyers since 1993 in both the Ontario Court of Justice, the Superior Court of Justice, numerous times in the Court of Appeal. I had the good fortune of arguing in the Supreme Court of Canada as of right and failed and took three cases to the Supreme Court but was denied leave.

I have one case left on my docket. It's on December 19 in the Ontario Court of Appeal. I also have a Court of Appeal judgment that just came down. I have 30 days to

appeal that and I'm going to to the Supreme Court of Canada.

Other than that, I have very little to do except concentrate on this process, and due process I know something about. The due process that has occurred in this case has been destroyed. If I could have the one and only document that I'm going to show that I think shows this, this one document out of 3,000 that I've filed? It's hard for the audience to read maybe, but this is an email from the Joint Review Panel and it attaches some emails that I presented to the Joint Review Panel.

The first email was a subject that I sent to the Joint Review Panel. It says: CNSC fails miserably in watchdog role related to New Mexico DGR disaster. This email is dated, March 20, 2014, just a month after the disaster in the Carlsbad, New Mexico WIPP.

Then in the next email in the attachments sent by the Joint Review Panel is the word "SPAM" to my email subject: New Mexico DGR radiation disaster requires termination of OPG's DGR.

My next email, also was spammed

by the Joint Review Panel, entitled: DGR process must terminate in light of New Mexico nuclear waste dump disastrous radiation link contaminating workers.

There are numerous other spammed emails on this email.

The email from the Joint Review Panel on March 20, 2014 advises me:

"This will acknowledge receipt of the attached email messages. The DGR Joint Review Panel has directed me to advise you that these submissions will not be accepted or included in the public record. Please refer to our February 10, 2014 message to you for further information." (As read)

You scroll down and for further information the Joint Review Panel says to me:

"The submission does not add new information that will aid the panel's deliberations. The panel has already heard

and noted your objections regarding fairness, due process and bias both prior to and during the hearing. Your opinions regarding the suitability, the geology, depth, et cetera, are not supported by any new information." (As read)

Those are related to the fact that our town, Saugeen Shores, was found to have unsafe geology for a DGR even though it's only a few short kilometres from the DGR proposed, so here I have this panel taking my emails and putting them in a spam file, which means they considered my emails to be junk mail.

THE CHAIRPERSON: Mr. Mann, I have been somewhat patient up to now, but I'm afraid I do have to interrupt you.

The instructions at the beginning were very clear, and you began well. You were addressing one of the six topics. The questions that you're now bringing forward have been dealt with in previous rulings by this panel or previous information, such as why some of your

emails are labelled with "SPAM".

Your issues around due process have been, in your submissions, couched in terms of a request for ruling, which we will do in due course, but unless you are willing to start talking about one of the six topics in front of us and add new information for the panel's review and benefit, I would ask you to please cease.

MR. MANN: Dr. Swanson, my presentation includes the fact that the WIPP DGR catastrophe failed and deserves to be terminated. My presentation, that you accepted and put on for today, was the presentation that I sent to you by email. Those emails had my same questions and concerns in those emails that were spammed by this panel, so that's why I'm bringing that up. You've already spammed them and you didn't accept them then, so I'm sitting here, I cannot be heard in a fair manner by this tribunal and I'm upset. You can bet I'm upset. I'm a citizen, an upstanding citizen, in this community that has been --

THE CHAIRPERSON: Mr. Mann, you have some minutes left to help the panel understand why the WIPP situation is relevant to

our consideration of the proposed DGR. Would you please proceed?

MR. MANN: Well, OPG relied on the WIPP DGR as the state-of-the-art, the poster child, as it's been called, the best DGR in the world. You three panel members went there and you've got a photo op regarding it. You've also reviewed the WIPP DGR. I'm a citizen of this town. This is the best thing going, that's what OPG said, can't be beat. All of a sudden, February 14, a radiation leak, catastrophic, disastrous, 22 workers contaminated, exposed. The place shut down and it's sealed, it is sealed today, and they don't know why and they don't know how.

What did we hear today from OPG: no problem; so what, it's not gonna hurt ours; we don't have to do a thing about our DGR. It's poor management. They throw the WIPP DGR under the bus when it's not in their favour, but when it was going good, boy, their safety case -- look at that, 15 years they've had a wonderful safety case. Now they're telling us: well, in the past few years since we've convened management has gone to hell there. It's just nonsense.

The WIPP community was told by the officials this will never happen, just as we're told it will never happen. How can we trust that? What are they going to do about it if it does? As a citizen I'm very concerned. I sent materials to you. I was spammed. I wasn't accepted. Now I'm trusting that you're going to listen to me? I don't have a --

THE CHAIRPERSON: Mr. Mann, you now are out of time. We can assure you we've heard you, and of the 3,000 pages, apart from a couple of your emails, we have read them, so you can be assured that we have read and we have listened. I'm afraid now, though, that your time is up. Thank you.

MR. MANN: If I could just note that the unlawful, closed meetings of the Bruce County council noted the WIPP trip. They talked about the WIPP and we weren't involved in those. Seven years of no consultation with the community. The mayors got together in secret, closed, unlawful meetings, and that's been proven and they admit to it. We lost seven years of education from OPG. They met with OPG, CNSC, NWMO and we weren't included. We need seven more

years of education from these people before we can even get started on this thing.

You can tell I'm upset, but I am a citizen of this community and I think I'm entitled to a little deference here. I'm 63 years old. I've got very little to do now, but I'm telling you a court has got to look at this. This is ridiculous. There is just no way that we should be left out of seven years of meetings, unlawful, closed meetings. We were left out of those while CNSC and OPG sell this thing to mayors who have no idea what the citizens want.

THE CHAIRPERSON: Mr. Mann, you have made that point as well. Thank you.

MR. MANN: The only thing this --

THE CHAIRPERSON: Mr. Mann, I must ask you now to please cease. You have gone well over your 10-minute allotment.

MR. MANN: If I could have just one more point?

THE CHAIRPERSON: You are really stretching --

MR. MANN: I know I'm stretching it.

THE CHAIRPERSON: Remember my

opening remarks on balancing the fairness of one for the fairness of all. You're taking time away from the remaining presenters and we're already at 25.

MR. MANN: If I could just --

THE CHAIRPERSON: Very, very quickly.

MR. MANN: The Joint Review Panel, looking at the merits, has to decide is there a need for a DGR for clothes and rags, to bury what workers used a mile underground, because that's what you're looking at, and is there a need when Quebec and New Brunswick don't have a need for it? They're going to keep their clothes and rags above ground, so Ontario is going to foot the bill for this, the whole thing, every level of government. Everything involved in this is the model for how not to do due process. A court has to look at this. The courts have to look at this and correct and remedy the serious due process violations and charter violations here. I urge you to dismiss the application of OPG for these incomprehensible violations.

Thanks.

THE CHAIRPERSON: Very well,
Mr. Mann. Thank you.

MR. MANN: Thank you.

THE CHAIRPERSON: Our next
presentation is from the Power Workers' Union.
Would the representatives of the union move
forward? Thank you. You may proceed.

May we have some assistance with
the PowerPoint, please?

--- Pause

PRESENTATION BY / PRÉSENTATION PAR:
POWERS WORKER UNION, ROBERT WALKER

MR. WALKER: Good afternoon. My
name is Bob Walker. I'm the Vice-President
responsible for the nuclear sector for the Power
Workers' Union.

With me today are, to my left,
Sheldon Speedie. Sheldon is the chief steward
responsible for the OPG employees at the Bruce
site. Sheldon also lives in the area. Sheldon
is a resident of Port Elgin.

To my right is Dave Trumble.
Dave Trumble currently is a health and safety

staff officer with the Power Workers' Union, but his career took place at the Bruce site, both for Ontario Hydro and then Bruce Power. He has been kind enough to come and help us out for a few years before he heads off to better things, so it is important, I think, it's relevant to know, that both Dave and Sheldon are residents of the area.

First, I'd like to draw your attention to our written submissions, both our initial one and our supplemental one.

Who are we? We represent workers at nuclear facilities across Ontario, very much like our friends from The Society of Energy Professionals that were here earlier. We represent people with the same companies as they do, including the Western Waste Management Facility at the Bruce site. We have represented workers in the nuclear industry since the very beginning of the industry in Ontario.

We are a local of CUPE, so we are affiliated with CUPE National, Canada's largest union. I think we have 627,000 members and rising. We are affiliated with other labour organizations, such as local labour councils, the

Ontario Federation of Labour and the Canadian Labour Congress. We also are involved with a national organization called the Canadian Nuclear Workers Council and an international organization called the International Nuclear Workers' Unions' Network.

The reason I talk about that is because we use that network with other unions to share information. If we have information, such as a licence hearing, such as radiation protection training, et cetera, we do share those with other unions. An example came up earlier today about the flood at McArthur River. I went out to help the steelworkers and Cameco with that investigation. When we get into issues with mining, we will go and count on those same brothers and sisters both with Cameco and Areva in Saskatchewan to help us out, so we do help each other out.

I think our knowledge, our experience and our history make us uniquely qualified and a credible voice in the debate on nuclear power. That's the reason why we've come here. We think that it's a responsibility for ourselves to come and give that information.

Our submission today or our talk today is going to be briefly about the relative risk analysis, waste inventory, and the recent incidents at the waste isolation pilot plant in New Mexico. I know we have talked about that quite a bit already today so we will go through it fairly quickly.

I'll start with a risk analysis because this is where this first came to our attention. As indicated in our written submission, we have reviewed the report of the independent expert group on risk assessment and we have no new concerns, but when Dr. Greening raised concerns shortly after the last round of hearings obviously we were quite concerned because he indicated concerns with the characterization of the waste and the impact on that characterization on worker health and safety, so we got involved right away. We have had meetings with OPG on this and, like I say, we don't have any further concern about it.

It's important to note that our protection is based on real time survey results, so we've actually taken real time surveys. Our protection is based on those measured results as

well as our training and the radiation protection procedures, et cetera, so we feel comfortable because that's what we base our safety on is safety as required at the moment.

The other part of this that's important to us is, we talked about this a lot in the last round, we have a very robust safety program. The society talked about it a bit already. We've negotiated health and safety provisions that are much more provident than what's required under the law. It really, I think, demonstrates the strength of health and safety within the union and within our structure. The PWU ensures that health and safety performance is the number one priority for our members.

And we can see that demonstrated in a number of cases. We have, for example, radiation limits. We have negotiated contract language where we have stricter radiation limits than what the law says. We have joint committees on radiation protection. We have ALARA committees to keep our exposure as low as reasonably achievable.

So we have put a lot of time and

effort into negotiating provisions to improve our safety.

Again, this was all fully explained in 2013. But I just hope that it gives the public a sense of how important safety is to us and our members, and that people understand that by protecting ourselves we are protecting the public because it has to go through us first.

I do have a little bit more to say on this, but in the interest of time I will move forward. And the next slide is about waste inventory. And I am going to turn the presentation over to Sheldon Speedie for that. Thank you.

MR. SPEEDIE: Sheldon Speedie, for the record.

Just a brief mention about waste reduction and worker safety that I have to say. In regards to the waste inventory that we currently have on site and we talked about in our 2013 submission, we are fully supportive of some of the things we heard at that hearing around the reduction of waste. We currently have an inventory.

We have been working with OPG on

a long-term strategy and very recently have started a pilot. And we are looking at ways that we can actually work with our members and with OPG and reduce the current inventories and thereby reduce the footprint.

Our members have been involved with OPG's waste reduction initiatives on monthly and weekly meetings and strategies on how we might go about that.

And as of this week or next we should be starting this pilot program and looking at sorting, segregation and decontamination of some of the newly generated wastes that are coming in and some of the historical wastes that are actually out there and have been around for years.

In regard to the safety programs, we will ensure our workers' safety is maintained during all waste reduction procedures and processes. Similarly with DGR, we will be looking at that as well.

The environment that we work in at the Western Waste Management Facility is one in which any worker can bring up a concern at anytime to management, to their supervisors. And

they can do that without fear of any reprisal, without fear of any kind of worker repercussions.

And it is done on a daily basis, it is done on a weekly basis, and on a monthly basis. And we have many programs that Bob has already talked about that we can escalate that through the process up to and including involving the regulatory people, if it is necessary.

So that is my part of the presentation.

MR. WALKER: For the record, Bob Walker. I will left Dave Trumble look after our next slide on the WIPP.

MR. TRUMBLE: Thank you. Dave Trumble, for the record.

As with any incident, the PWU supports the aspects of lessons learned. We have had discussions with the union that represents the workers at the WIPP site in New Mexico and they are members of the United Steel Workers.

The United Steel Workers is the largest union in North America. United Steel Workers represents workers in Canada and nuclear facilities in the United States. And we have also had discussions with OPG.

We submit that the incidents at the WIPP are not likely to occur at the OPG DGR due to several factors. Our health and safety involvement and intrinsic safety culture is superior to the union involvement at the WIPP. Our members receive more radiation training and conventional safety training than their counterparts at the WIPP.

Our members are trained to protect themselves in regards to radiation where (microphone cuts out) rely on radiation specialists for their protection. Our system is known and is supported by both the employer and the unions as a self-protection model.

PWU members also receive extensive operational training. Another very important aspect in the regulatory oversight at the WIPP, the regulatory agency at the WIPP is the Department of Energy. Whereas at the proposed OPG DGR the regulator is the CNSC.

The CNSC is the independent regulator, whereas the Department of Energy is the owner and the operator. This suggests that the CNSC will exercise its regulatory activities in a completely independent fashion.

Thank you.

MR. WALKER: I know we are out of time, so I will be really quick with my closing comments. For the record, Bob Walker.

The first thing, risk assessments. There has been a lot of confusion at the Bruce site about the project which I think has created a lot of the controversy.

Some people confuse this with the NWMO's search for a site for long-term storage of used fuel. And that is a totally different project and, I mean, it is nothing similar at all. But a lot of people we talk to have the two confused, and we think that is a big part of it.

Another one is we talked about regulation. I talked to a representative from the NRC two weeks ago and asked him about the NRC's oversight at the WIPP. And he said, they don't have any because it is not operational waste.

We are talking about operational waste from the nuclear power plants. The WIPP facility is not operational waste. I believe their primary customer is Defence. I could be wrong in that, but that was my understanding.

Waste inventory. Sheldon talked about that quite a bit already. We are very interested in doing everything we can to help OPG reduce the waste.

The WIPP, Dave talked about that well, so I won't talk about that.

We don't believe that there are any new environmental impacts. We think everything has been presented very well. From our written submission I did say that we are going to Sweden to look at their facility, and we did that. I think the country, the culture, everything is very similar to Canada, the regulatory framework very similar to Canada.

The geology is a bit different, but they are storing operational waste in a repository. It is a permanent storage solution in a repository in Forsmark, Sweden. It has been in operation since 1988.

Myself and my staff officer went there a few weeks ago. And it is an extremely well-run facility, it is extremely clean, it is like going to a subway station, it really was that clean and orderly. And I think that there are good models out there and I think we can from

them.

The PWU remains in full support of this project. Thank you.

THE CHAIRPERSON: Thank you.

Panel members, do we have any questions?

MEMBER ARCHIBALD: Just one short question.

We had heard in a previous presentation that mention was made of joint working committees at OPG and higher levels of safety management as being better than normal standards of occupational health and safety in Ontario for the workplace.

And you just mentioned the union involvement, such as your opinion that the union involvement at OPG is superior to that at the WIPP; there is better training, there is self-training supported by self-protection ideals and so on.

Would you agree that these and other OPG initiatives would apply as being more robust and better functioning pathways for processes and procedures than at the WIPP?

MR. WALKER: Well, I will comment

very quickly on the processes right now for health and safety. And I don't want the union to take all the credit because we also have -- very unique is the oversight we have both Ministry of Labour oversight and CNSC oversight which helps.

We spent a lot of time talking with our members about the IRS, but we do have the multi-prong approach: we have the joint health and safety committees; we have negotiated additional training for those committee both from the employer; we provide them additional training ourselves; and we have joint working committee, we have the senior committee that Scott Travers talked about; the president's committee. So there is a multi-layer of people looking at these things.

Specifically to radiation protection, we have ALARA committees and Joint Committee on Radiation Protection. So there really is a lot of people all the way through the organization right up to the very senior level of the unions and the company that are looking at these things.

Including for the Bruce site for Western Waste Management, Sheldon sits on the

Joint Committee on Radiation Protection with me, we have a management representative from Western on that committee, Dave Trumble and I both sit on the Joint Working Committee, and all three of us sit on the Joint Committee of Radiation Protection.

And, Dave, do you want to add?

MR. TRUMBLE: Sure. Dave Trumble, for the record.

I am just going to say, perhaps one way of looking at it in a very very quick hit is every year the Joint Working Committee, and to re-emphasize, that is all three major workplace parties, the Power Workers Union, society, and the employer. Well have an opportunity to review the corporate safety policy and actually have input into that policy.

I don't think there is too much clearer indicator of the deep involvement that all three parties have, unless you take a look at that corporate high-level policy, and how much involvement there is actually to play out there.

MEMBER ARCHIBALD: And based on your union input, this does not occur or has not occurred at the WIPP?

MR. WALKER: For the record, Bob Walker.

We talked to the representative of Steel Workers down at the facility and their staff officers, and we have talked to them a couple of times now, and they do have joint health and safety committees.

They don't have the same regulatory requirements down there as we do, but they do have negotiated joint health and safety committees, but their involvement is very minor. They don't have nearly the -- I don't want to use this word wrong, but they don't have nearly the power we do in the workplace.

And Dave Trumble has talked to them quite a bit. Dave, do you have any...?

MR. TRUMBLE: Maybe to change that -- power probably isn't, as you say, is maybe a word that is not the best word, but influence. The ability to sit with the employer. And that joint working committee truly does meet every single month.

Health and safety committees of which in my role as a staff officer I have at least touched home with almost every health and

safety committee within OPG, some of them actually meet in a short a frequency as every two weeks to ensure that the opportunities for discussion and involvement in correcting health and safety issues are first and foremost.

In Sheldon's case, Sheldon you may want to correct me, but I'm sure that the health and safety committee meets, at a minimum, monthly with ad hoc and emergency meetings called whenever necessary.

MR. SPEEDIE: Yes, that is correct, Dave, they do meet on a monthly basis and whenever there is an incident they will get together and have a discussion around any incidents that may happen or problems that come up in the workplace on a daily basis.

MEMBER ARCHIBALD: Thank you very much.

THE CHAIRPERSON: I did have one question for Mr. Speedie.

Could you describe in just a bit more detail the Pilot Waste Reduction Program?

MR. SPEEDIE: Sheldon Speedie, for the record.

Yes. What we are looking at is

trying to -- any of the new waste that is being generated, if it is not contaminated what we are planning and what we are working on is that we will actually take it out of the radioactive stream so that it isn't going to be radioactive waste. And it would be segregated away from that respect.

Similarly, if the pilot goes the way we think it will, we plan on going back and grabbing some of this legacy waste and also doing that.

I can turn it over to OPG for a little more detail, if they have more detail on it. I have been involved and I get a weekly update on where we are at and what we are doing. From a longer term perspective OPG would have more detail on that.

THE CHAIRPERSON: Yes, please, if OPG could help out?

MS MORTON: Lise Morton, for the record.

Yes, this has been an initiative that we have had ongoing for a couple of years and it keeps building. And I do want to publicly thank the PWU and Sheldon in particular, they

have been very supportive of it.

So it is a matter of understanding that, as we have said, we have had several campaigns where we have inspected waste, we have visually opened containers and we do believe that there is some opportunities to further reprocess some of that waste or to decontaminate and potentially free release some of that waste as well.

With a view of, you know, as much as we can, minimizing the current footprint and the future footprint.

Again, to elaborate on specifically where we are at right now, we are preparing within the waste management facility itself an area of the facility that will have the appropriate equipment for surveying, to manage the ergonomics of our workers of course handling this waste, for protection, principles that need to be applied to do this kind of waste.

And it will be our workers that are opening and sorting waste and segregating it into various waste streams following obviously approved procedures that our health physicist is overseeing, et cetera.

It is some thing that our staff are quite actually engaged in and they too want to see us do as much as we can to reduce that environmental footprint.

So it is relatively new what we are embarking on. Sheldon is right, we are about a week or two away from implementation. And it is a pilot for us to be able to really understand the resource requirements, the costs involved and what benefit we can get out of it.

THE CHAIRPERSON: Thank you very much.

So that concludes the questions for now.

Again, as with the previous presenters, if you could remain available for other questions should we have the time?

The next presentation is by Mr. William Bowden.

PRESENTATION BY / PRÉSENTATION PAR:

WILLIAM BOWDEN

MR. BOWDEN: Madam Chair and Members of the Panel, my name is William Bowden.

My wife and I are residents of Roswell, Georgia, and we have a summer, soon-to-be retirement home, in Southampton where my family connections go back more than 100 years.

Thank you for letting me speak to you today. I will refer to five of the six subjects the panel is reviewing during these hearings: methodology used to determine significance; expansion plans; updates to the geoscientific verification plan; relative risk analysis of alternative means; and applicability of recent incidents at the WIPP.

My comments will address these collectively, because I see them as aspects of the same problem.

The risk assessment presented so far is flawed. The case for environmental safety has not been made.

Three days after the July 21 deadline for submitting our statements to the Panel the National Academy of Sciences in the U.S. released a report titled, *Lessons Learned from the Fukushima Nuclear Accident for Improving Safety of U.S. Nuclear Plants*.

The Technical Advisor for the

National Research Council, which produced the report, Dr. Najmedin Meshkati of the University of Southern California, had previously published an analysis which established that the Fukushima disaster was not a natural disaster, but was manmade.

I do not have enough time to repeat key recommendations today. But recommend the full report to the Panel with special attention to recommendations 5.1A, 5.2A, 5.2B and 5.2C, and findings 7.1, 7.2 and 7.2A.

The CNSC documents website does not reveal whether this report has been drawn to the Panel's attention.

On July 26, 2010 an oil pipeline ruptured and spilled into Talmadge Creek, a tributary of Kalamazoo River in Michigan. Oil flowed for 18 hours before the leak was stopped. Thirty-five miles of the Kalamazoo River were closed and the environmental damage persists.

But there has been no significant adverse environmental impact to Lake Michigan because the spill site is 82 miles from the lake.

Moreover, the spill did not disrupt oil supplies to eastern refineries,

because there were alternatives and the pipeline could be fixed quickly.

You have received several reviews of the February 14, 2014 release of radiation at the Waste Isolation Pilot Project in New Mexico, all of which point to human error and the failure of the safety culture as causes.

Few of the reviews commented on the implications for the Departments of Energy and Defence. This is a pilot project, but they have no alternative, all their eggs are in one basket.

But there is a bigger issue. A year ago the WIPP was a positive example in support of the DGR. And I don't recall CNSC raising concerns about safety regulations, compliance, and culture at that time.

Today's hearing reminds us that we learn more from our mistakes than our successes. Cold comfort when the mistakes can have such severe consequences.

On October 13, 2013 this Panel heard a long presentation about the storm water management pond. The questions that followed included discussion of the difficulty people had

with conceptualizing the size of the project.

At the time, Madam Chair, you asked for a calculation of the size of the pond in relation to a backyard swimming pool. That question was not answered.

The data presented last fall and repeated this summer doesn't give us tools for an accurate calculation. But based on some assumptions, my guess is it will be about 144 times the size of a 40' x 20' pool. Note that there is no plan to increase the size of the pond.

CNSC states on page 27 of PMD 14-P1.2, that is document 1915, "During construction of the expansion water flow to the system is expected to be the same and therefore the storm water management pond should be" my emphasis added, "adequate."

What troubles me here is that the slag heap will be increased from 15 to 45 metres in height and from 9 to 11 hectares in surface area. And yet we are to believe that this massive increase in project size will have no impact on the pond.

For the conceptualizers among us,

the posts for the wind turbines outside the Bruce site are 78 metres high, so the slag heap would be about 60 per cent of that height. And a major league baseball field, the whole field, not just the infield, is about 1 hectare in size.

Let's remember that this is a storm water management pond, not Fairy Lake in Southampton. Its purpose is to slow, but not eliminate storm water runoff and it is designed to "flush out storm water to avoid shaft flooding."

So PMP assumptions are very significant. At these hearings last year we were told that a 100-year event was 74 millimetres, and the flooding in Toronto in 2013 was caused by 125 millimetres of rain.

Yet Environment Canada's sufficiency review, that is document 1906 posted on July 2, pages 4 and 5, quotes page 7 of the OPG response, and I quote:

"While future climate conditions may result in storm events that exceed design capacities, such changes in climate are

expected to be gradual. This provides time to modify the engineered drainage features." (As Read)

To which Environment Canada adds, and I quote, "OPG's overall response is sufficient."

Even laypeople like me have learned that while overall climate change may be gradual, the frequency and severity of extreme events has already increased. If you doubt this, perhaps you could interview people from Burlington, Detroit or Long Island.

I have not checked Kincardine storm water management by-law, but expect it will include maintenance requirements. Remember that the pond for the DGR will not be maintained following closure. So that runoff from the slag heap will quickly turn Baie du Doré into Baie du Bouse.

My final example also comes from CNSC PMD 14, that is document 1915.

Pages 15 to 17 of this document lists 13 preliminary trigger criteria for the updated geoscientific verification plan. But the

only information about what happens if these and other criteria indicate failures is that adaptations will be made, as needed, at that time.

This seems to me like an admission that adaptive phase management is just using \$10 words for we'll figure that out when we get to it. With more time and better research resources, we could find many more such examples.

How does this all tie together to my conclusion that the case for environmental safety has not been made? Last fall you generously allowed me to speak. At that time I complained that the applicant had failed the first principle of prudence in risk management for fiduciaries, which is diversification.

The proposed DGR1, the expanded DGR1 and DGR2 which is still on the table for the Kincardine location, represent a huge concentration of risk.

Today I draw your attention to a second failure of prudence and risk management. Prudent investors conduct a liquidity analysis -- perhaps a poor word to use so close to Lake Huron -- of investment alternatives. In

financial planning we could call it an exit strategy.

What happens if it doesn't work? What are the consequences and how can you get out of it? The applicant has not done this analysis.

Interestingly, what I thought was the most important reason for locating the DGR here instead of in the Precambrian Shield was the transportation risk, yet the OPG's summary of the Independent Expert Group Report includes a slide that treats this as fairly low risk and low consequence.

On the other hand, unlike the Enbridge oil spill in Michigan, if something goes wrong here, whether it is simply stormwater runoff or a structural failure 600 metres underground, it will go very wrong, very fast. To use the risk analysis formula of the Independent Expert Group, we may have something that is low likelihood, although many presentations to you challenge this assumption, but the consequence is extreme.

Remember that the WIPP is in a desert, 53 kilometres from Carlsbad, New Mexico, population 26,000. The proposed DGR is on Lake

Huron, in good farmland, with more than twice as many people living nearby and millions more downstream. Over and over and over again we hear, "No significant risk of adverse environmental impact." It reminds me of Frank Zappa's immortal song "It Can't Happen Here", but of course that was meant to be ironic.

Thank you for your time and patience.

--- Applause / Applaudissements

THE CHAIRPERSON: Thank you, Mr. Bowden.

Panel Members, did we have any questions?

MEMBER MUECKE: Perhaps to OPG.

In terms of the stormwater management pond and the DGR expansion and climate change, could you elaborate on whether the spatial requirements exist on the site to expand the pond to accommodate these contingencies?

MR. WILSON: Derek Wilson, for the record.

I think there are two points to make.

If you recall back from the 2013

hearings with respect to the storm event that would be ultimately reviewed for the sizing of the stormwater management pond there was a commitment that we would undertake a review of that with the CNSC as to the appropriate return period that would be considered as the design basis for that.

Having said that, though, the spatial relationship with respect to the stormwater management pond and the waste rock management area was provided in the expansion IR response in terms of the spatial relationship of the waste rock management pile and the ability to increase the size of the stormwater management pond on the site is significant in the northwest portion of the site. So there is a considerable amount of real estate still available on the site should we need to expand the stormwater management pond away from the north marsh.

THE CHAIRPERSON: And if I could ask a follow-up to that.

If OPG could again just comment briefly on the consequences of an unplanned release from the stormwater management pond? The Panel would be particularly interested in

distinguishing among the various constituents of concern that would be in a stormwater management pond versus in the repository itself.

--- Pause

MS SWAMI: Laurie Swami, for the record.

In our little discussion there we thought that this was perhaps a little bit of a complex question and we would suggest that we could come back tomorrow morning with a better response to that, if that's acceptable.

THE CHAIRPERSON: Actually, even better than that, perhaps we could forward this over to the day where we are discussing significant adverse impacts, because I'm pretty sure we will get back into it on that day.

Mr. Bowden, you do raise some interesting issues and if you are interested and are able to, if not in person follow on the webcast, we will come back to that question on that day.

MR. BOWDEN: Thank you.

THE CHAIRPERSON: We will now proceed with the next presentation by the Women in Nuclear.

**PRESENTATION BY / PRÉSENTATION PAR:
WOMEN IN NUCLEAR, COLLEEN SIDFORD AND
STACEY GEOGHEGAN**

MS SIDFORD: Good afternoon, Members of the Joint Review Panel and members of the public. My name is Colleen Sidford, I am the President of Women in Nuclear Canada, or WiN Canada as we call it for short.

With me here today is Stacey Geoghegan, who is a Senior Technical Engineer and Officer at the Western Waste Management Facility of Ontario Power Generation and a member of WiN Canada. Stacey and her husband and two children live in this community and she was worked at the Bruce nuclear site for over 10 years.

Stacey and I are here today representing over 1,350 WiN members across Canada, the majority of whom work in power generation and many work at the Bruce site.

WiN Canada has three important goals:

to continually update our knowledge of nuclear so can can better educate

the public;

to provide professional development and support for women working in the nuclear industry; and

to promote careers in the industry and science to youth, especially young girls and women.

WiN believes in educating our members about all aspects of the industry, provide them with the accurate information necessary to help educate our family, friends and members of the public. This dialogue provides an opportunity for the public to make an informed decision about whether or not they choose to support the industry.

In our industry, where women represent less than 20 percent of the total workforce, our organization works to showcase the vital contribution women are making as leaders in the nuclear industry. WiN members devote a great deal of their volunteer time working with young women and girls introducing them to non-traditional, but rewarding careers in science, technology and skilled trades.

The nuclear industry is one of

the most securely regulated industries in Canada. In adherence with rules from the Canadian Nuclear Safety Commission, various levels of government and the companies who employ our members, we have a very strong nuclear safety culture. With stringent oversight, regular safety audits, international peer review and our members' own personal accountability for the safety of their coworkers, our industry has put many procedures in place to ensure that our safety procedures and maintenance remains at an extremely high level.

It is important to note that the same safety culture in power generation also exists in our nuclear waste management. It is this experience of not only safely managing waste, but also the many decades of experience in operating nuclear stations -- some which are recognized as world leading -- that will be applied to the responsible and safe management of the DGR operations.

WiN Canada members work at nuclear generating stations by choice and live in the communities surrounding the station and associated waste management facilities. We are highly skilled workers who could work in any

industry, but choose to work in nuclear because we know that we are helping to produce a clean, safe, reliable, low carbon base load source of power that is an important part of Canada's clean energy portfolio.

We all understand our responsibility to work ,safely not only to protect the safety of our fellow workers, but to protect the safety of the communities in which our families, our children and our friends reside. We do not take this responsibility lightly and put safety first each and every day at work. The strong culture of safety also spills over to our activities outside of work at home and in our volunteer activities.

Many of our members have raised their children within a close proximity to the Bruce nuclear site. As mothers we worry about the safety and well-being of our children basis; as employees we know that Canada's nuclear power operations and waste management have a proven track record of being among the safest in the world. We would not work in this industry and live in these communities if we did not feel it was safe to do so. The safety of our families,

friends and communities comes first before our chosen careers. We also believe this is the same for future generations. This focus on safety is not just about today, but for those people who will continue to live and work in this community for many years to come.

Although this topic has been covered in greater detail by other presenters, we wanted to briefly mention in our report the EIS-12-513 - Relative Risk Analysis of Alternative Means, which speaks to a number of technology alternatives.

While other options could safely manage the waste and protect the environment, Kincardine's unique geology, coupled with the engineered design and the location of the secure facility where much of the waste is already stored provides a robust and safe option.

Our members are industry leaders and experts who fully understand nuclear. It is a unique industry with unique hazards that require the highest levels of professionalism in the care and handling of materials. Our members who work in the industry understand the risks and believe that this is the responsible safe

approach for the long-term management of waste.

In regard to the recent incidents at the Waste Isolation Pilot Plant, WIPP, and the updated information contained in EIS-13-515, the general conclusion was that the fire incident was the result of degraded safety procedures and ineffective implementation of training programs.

We understand, and this has been repeated several times today, the cause of the release of radiation is still under investigation and has yet to be determined.

While our existing training and safety procedures are very effective, our members realize that every incident is an opportunity for learning and growth. WiN Canada members believe that OPG is committed to ensuring that any lessons learned from the WIPP incidents will be incorporated into the design and safety case of the DGR, if applicable, and will be reinforced in future training, field procedures and management expectations.

We are very confident that OPG's current safety culture will extend to the operation of the DGR facility to ensure the safety of workers, the public and the

environment.

The foundation of this approach is built on a strong nuclear safety culture that will be applied to the future long-term management of waste. Stringent oversight and international reviews and audits will ensure the nuclear safety culture does not erode over time and will in fact continue to strengthen through continuous improvement and learning.

Much of OPG's low and intermediate level waste is already stored safely on the surface on the Bruce nuclear site. As we understand the need for a long-term management solution for the low and intermediate waste to ensure we do not leave this legacy for our children and grandchildren. We understand that it is our industry's obligation to deal responsibly and safely with the long-term storage of the waste we produce while providing the province with a 24/7 ready supply of clean, base load nuclear power generation.

OPG's commitment to public safety and environmental stewardship includes the safe, secure and responsible management of all nuclear waste. As employees of the industry we know that

OPG has years of experience in radioactive waste management and has the expertise to manage all the waste responsibly. OPG has a successful history of safely storing its nuclear waste at all three of its waste management facilities, at the Bruce, Pickering and Darlington sites, over the past 40, 20 and 5 years, respectively.

As previously stated, WiN members work and live in close proximity to these managed storage facilities. As we stated in our original submission, the DGR project will result in positive socioeconomic effects such as increased employment, income, business activity and municipal revenue. We would like to see the community's young people be able to remain in the Bruce area and have the ability to work at highly skilled jobs which will provide our families and friends with a good standard of living while working in a safe environment.

Following international best practices, Canada continues to be the world benchmark for the safe storage of nuclear waste. Based on existing expert knowledge, our members feel that the DGR is the best solution at this time to continue Canada's nuclear safety culture.

It is important for us to stress that WiN Canada members are highly skilled workers and we would not be working at this type of facility if we did not believe in the technology and its safety. We support the approach of OPG in providing a long-term management plan for low and intermediate level waste. It is important to deal with the waste our industry produces today and not leave it as a legacy for our children and grandchildren.

It is imperative that all our families and friends who live in our communities will be safe each and every day. The DGR will provide for the safe storage of low and intermediate waste and will provide highly skilled, good paying and safe jobs for the next generation.

WiN Canada believes the existing, well-regulated practices in the nuclear industry focusing on the security and safety of the facilities, workers and the public will be incorporated into the DGR; therefore, we continue to support OPG's application before this Joint Review Panel.

Thank you.

THE CHAIRPERSON: Thank you very much.

Panel Members, did we have some questions?

Thank you so much for your presentation.

I understand that the Secretariat are having some problems connecting with Gordon Edwards so we will proceed directly with the presentation by Jill Lennox.

--- Pause

PRESENTATION BY / PRÉSENTATION PAR:

JILL LENNOX

MS LENNOX: Good afternoon and thank you for this space to speak.

As you know from my submission it was probably too long. I have just driven for a couple of hours and I'm feeling a bit wonky and then I walked in and listened to Don Hancock's presentation and much of what I was summing up was his remarks so I'm going to keep this very brief.

Yes, I'm not even quite sure

which points I'm going to come up with, but basically everything that I wanted to say has been said and I know you don't want to hear things over and over again.

So I just should probably introduce myself by saying that the happiest days of my childhood were spent here in Kindcardine and also three miles north of here at Stoney Island and I totally love the area and the lake. And so when I got here today, I had driven up from Toronto, and the first thing I did was just go and greet the lake. I went down to the beach, stuck my feet in the water and it made me feel much better, not great, but much better.

I love the area and have, as you know, felt like many of us, just deeply disturbed by anything that could disturb the nature here.

It's very interesting listening to the other ladies who just spoke because I feel the same way. I have children and grandchildren and I guess my feeling is that the only way we can really keep them safe is to stop making nuclear waste. I don't really see any other way and I have been searching this to the deepest part of my soul I think since I first heard about

nuclear.

And I'm not a scientist and I'm not a lawyer and my field is literature so I don't really have much evidence of my own, just a deep intuition that something that we still haven't figured out how to get rid of it we should just stop making it, that that could make the world a safer place.

So I chose as my point WIPP because I felt that it probably needed the least expertise to refer to it or speak to it as an issue and since it happened -- it's happened twice, the leak -- I have been following everything that I could find on it and I think nothing -- well, between Gordon Edwards, who hasn't yet appeared today, and Donald Hancock and the Clean Air Alliance, I haven't really found anything new.

I was a bit disappointed with OPG's upgrade on the DGR after the first -- in March of 2014 because it seemed to me they were focussing on what they would do if similar things happened in the DGR. They were sort of preparing for these kinds of accidents and yet a year ago we were told that clearly there would be no

accidents because the poster child, the model that they were using was WIPP. So now everything has changed right around.

I started just reading everything I could find and, as I said, Don Hancock's points just seemed to me to be the most thorough and he was the closest to the situation and I have pretty well based what I wrote on what he wrote. That was in the *La Jicarita*. There were two articles, one after the first leak and one after the second.

I'm not sure if all those points are in his submission because I haven't had a chance to read it yet. In fact, I didn't know until last night he was going to be speaking today, but I'm really glad that he did. So I feel confident that these points that he made will be in his submission once I read it and that you are aware of them.

In the first article he looks at the various questions. He calls them "simple questions" that WIPP should ask before they proceed and I think the main one -- and certainly it was the main one when I heard about the accident -- is what caused it. He suggests that

WIPP doesn't reopen or do anything until they come to the root of that question: What was the cause of the leak?

They still haven't and my feeling is that this would be another good direction for the OPG to take in terms of the DGR here, that until WIPP can answer these questions, which I imagine you will find in Don Hancock's submission, given that they were the model we shouldn't be heading forth at all. That just seems to me commonsense and logical.

If you can't know the cause of something, you really can't fix it and that has to be first before we do new sprinkler systems or fire engines or anything else, we have to find out what really caused this.

The worrying thing that I read about was, well, one of the things they were thinking of doing, given that they can't get near it because of the heat and they have robots with cameras and all that, and you see these dilapidated sort of containers, is that maybe the containers weren't robust enough.

So I'm imagining, and I think I read somewhere, that one of the things they might

do therefore, or have to do, is present stronger containers, make stronger containers and that means taking the stuff out of the -- bringing it up, taking it out of the old weaker containers, putting it in the new containers and then putting it back down in the hole again. The whole thing just seems absolutely impossible to my little mind. I couldn't even imagine doing that.

So that just sort of astounded me. I couldn't see how workers wouldn't get -- I don't know. The whole thing just seemed impossible. But what did seem true is it would take a long time and I guess we would end up paying for it; we, the public.

And I just really believe that these things should be waited on and we shouldn't be rushing into this situation until we know what WIPP does and what caused it.

So zooming to my conclusion, I do hope that WIPP will discover the root cause of the leaks through an objective outside investigation and that meanwhile the OPG will not go forth with the DGR but will slow down the production of nuclear waste by shutting down all nuclear reactors in Ontario and when they come to

the end of their lifespan -- when they come to the end of their lifespan and refrain from building new ones.

The majority of countries that have depended on nuclear power are doing this and are accepting the reality that the increasing tonnes of nuclear waste is reason enough to phase out nuclear all together and invest in sustainable energy such as solar and wind.

Meanwhile, I believe, and I truly believe that the least harm will be done by continuing to store existing waste as we are now aboveground onsite and to adopt what has become Gordon Edwards' rolling stewardship policy for the future. It isn't great. It's a terrible burden to put on the future but it's the least, I think, dangerous of any other future that we can pass on to our descendants.

So that's about it. I thank you very much for your attention.

THE CHAIRPERSON: Thank you, Ms Lennox.

Panel Members, did we have any questions?

MEMBER ARCHIBALD: I just have

one short question. At least three times during your presentation you mentioned leaks; that is, plural. It was my understanding there was only one leak or one breach occurrence that occurred several days after the fire event. And you had mentioned on page 5 of your presentation that you attribute confirmation of the second breach and that photos of this container exist as described by Mr. Hancock.

Is it your understanding there was a second breaching event?

MS LENNOX: Yes, there was. The first one was in February.

Sorry, the first one was in February and the second one was -- just a sec. I think I say there.

MEMBER ARCHIBALD: I believe you said June.

MS LENNOX: Yeah, that's true. Well, that's what I got from my research from Don Hancock. He doesn't say that in his then?

MEMBER ARCHIBALD: No, he doesn't say that in his presentation but on page 5 you did attribute confirmation to him.

MS LENNOX: Yeah, it was. Hmm.

I didn't -- you know, last night when I decided not to include that part of my submission because I knew he was going to be speaking and I was sure he would cover at all.

So I just -- I just don't have it with me. It's in the car. But I'd be glad to go get it and confirm the date, because that's what I totally understood.

MEMBER ARCHIBALD: No, that's fine.

What I would do is ask OPG or CNSC if they have any knowledge of a second breaching event.

MS SWAMI: Laurie Swami, for the record.

We don't have any knowledge of a second breaching event and in fact, our team went to visit WIPP in July. So if there was an event in June that would have been fully explored at that time.

DR. THOMPSON: To our knowledge there were two events in February, one of fire and the second one a breach of a container. We are not aware of any event in June.

MS LENNOX: So perhaps it's just

his article took place then but that wasn't the impression I had. And he definitely entitled it, "Why? Why has the cause not yet been found?" Whereas the first one was dealing with the questions that we should ask or they should ask in that case.

So I'm sorry if I'm wrong about that, but I will check it.

MEMBER ARCHIBALD: That's fine. Thank you very much.

MS LENNOX: Okay, you're welcome.

THE CHAIRPERSON: Thank you very much, Ms Lennox.

Apparently we do now have Gordon Edwards on the phone.

So we are now ready to proceed with your presentation, Mr. Edwards. Are you there?

PRESENTATION BY / PRÉSENTATION PAR:
CANADIAN COALITION FOR NUCLEAR RESPONSIBILITY,
GORDON EDWARDS

MR. EDWARDS: Yes, I am. There may be a bit of time delay.

And is my volume all right?

THE CHAIRPERSON: Yes, we can hear you very well, thank you.

MR. EDWARDS: Okay, very good.

Well, thank you very much to the Panel for this opportunity to present. Unfortunately, due to a registration error I wasn't able to request a 30-minute presentation. I'm very glad to receive the 10-minute interval you've given me.

We all know that the proposed DGR currently being discussed was inspired by another project, the possible construction of a DGR for high-level waste. Not unreasonably, the Mayor of Kincardine asked the question, if a DGR is safe for high-level waste why not also for low and intermediate-level waste? And hence, we have this project being presented and discussed.

The elephant in the room in both cases is the question of abandonment. I noticed that the associations who earlier supported the idea and testified to OPG's capabilities of constructing and operating this facility made no mention of abandonment.

The interesting thing is that

many of the qualities that OPG has such as safety culture, oversight, accountability, root cause analysis, learning from the past and so on, make no sense once you abandon the waste. Because once you abandon the waste there will be nobody there. That's the whole problem.

The whole problem is that we are assuming that geological disposal combined with abandonment is a logical choice. In fact, it's being presented in many cases as if it were the only logical choice.

The fact of the matter is that we have had some embarrassing failures and we should really call into question whether the whole idea of abandonment is in fact scientifically valid or even an ethical choice for society to make.

As the Seaborn Panel said in their Executive Summary, quote:

"The concept in its current form does not have the required level of acceptability to be adopted as Canada's approach for managing nuclear fuel waste."

(As read)

Unquote. I would maintain -- my organization would maintain that the same applies to the storage of nuclear waste that remain dangerous as these wastes will for hundreds of thousands, even millions of years.

So this question of rolling stewardship, I would like to clarify a couple of things. It's not intended to be a permanent solution. It's not even intended to be a solution. It's simply an ethical waste management scheme that gives future generations the ability to protect themselves.

The problem with abandonment if it backfires is that future generations are saddled with the results of a situation where they do not have the necessary resources and tools or even knowledge to protect themselves and to take corrective action.

So when I look at the questions that were raised by the Panel I would like to say something about questions number two, number four, number five and number six.

Question number four, I believe, is the one having to do with alternatives. The only alternatives that are identified by the

Panel's questions are two of them are surface storage at the Western Waste Management Facility either in its current status quo condition or in some kind of enhanced condition. But both of these are right beside Lake Huron and many people on both sides of the border have expressed great trepidation over the idea of permanent storage of radioactive waste, nuclear waste right beside Lake Huron, right beside the Great Lakes.

So I'm surprised that the Panel did not ask about the possibility of rolling stewardship away from the Great Lakes. I think that most people would have assumed that when the Bruce facility closes down as it ultimately will, that these wastes would be moved to further away from the lake, much further away away from the lake because the only reason for them being at the lake is because the reactors require a lot of water to cool the core of the reactor during operations. There's no other reason to be so close to water.

So I do believe that we have to consider the future very carefully and we have to realize that making irrevocable choices at this point in time is based on the fact that we don't

have one single operating safe deep geological repository for nuclear waste operating anywhere in the world. So it seems to be a bit of a leap to assume that we're going to be the first and we haven't even broken ground.

Now, with regard to the WIPP experience, I would like to point out that although 22 workers were contaminated with plutonium dust at the WIPP facility as the result of an accident, we had hundreds of workers contaminated with plutonium dust at the Bruce facility and it wasn't even an accident. It was just during normal operations when they were doing the refurbishment of the Bruce reactors for a period of -- I believe it was something like six weeks. There was plutonium dust in the air and the workers were told by their superiors that they did not have to wear respirators or other protective clothing and as a result, hundreds of workers were contaminated. And this was not an accident. This was just as a result of improper administration.

Yet, I'm really very perplexed to see that as far as I know there were no penalties assigned to this. There was no -- nobody was

held accountable for it. There was no responsibility assigned.

And, yet, Dr. Frank Greening who had worked so many years for Ontario Hydro and then Ontario Power Generation, said that it was well documented that the pipes that they were handling had contained plutonium and americium and curium and other alpha-emitting materials. They should have known this. It was all documented and, yet, these mistakes were made.

But this is not really the main point. The main point is that we all know that humans are fallible. We all know that mistakes can be made.

Better to have a situation where we do have people with a good safety culture, people who are well trained, people who do have a conscientious regard for their own safety and the safety of others, to be in charge of this waste and to be able to be on the spot, to be able to monitor it and retrieve it and repackage it or repair it when necessary so as to protect the environment and to ensure that any situation that does develop is very quickly corrected. Again, it's this abandonment problem which is a

fundamental obstacle to a rational approach.

Now, sometime in the future if we do develop a technology which is truly fail-safe and truly proven to be safe in every respect, then we can move to that. Rolling stewardship is only intended to be looking after the waste until that time comes. That time, however, may not be in the lifetime of the nuclear power industry.

Therefore, careful planning and accommodations have to be made now. These conditions have to be institutionalized today so that there will be people who will transmit the knowledge, who will transmit the resources to the next generation and they to the next generation perhaps at 20-year intervals with the changing of the guard in order to ensure that these wastes are not just packaged in the status quo method but continuous improvement that we can improve. Each generation can make an improvement over what the previous generation did until such time as we actually reach a genuinely satisfactory solution that everybody can agree on.

Now, with regard to the long term analysis, this is question number two, the geological verification, there is a problem and

that is that geology is not really a predictive science. And just as in science generally we have had major upsets recently in the 20th century; in the early 20th century the discovery of quantum theory; in the late 20th century the discovery of dark energy and dark matter, who would have believed that such a thing would be possible?

And also, in the late 20th century we discovered in mathematics that what we thought were deterministic mathematical models that were able to give accurate predictions of the future, are not necessarily so.

When you have non-linear mathematical models and when they are iterated many, many times you can get chaotic behavior and you can get total unpredictability occurring. This was first observed in the 19th century but not understood until late in the 20th century. Henri Poincaré, the great mathematician and physicist, wrote in 1914, quote:

"A very small cause which escapes our notice determines a considerable effect that we cannot fail to see and then

we say the effect is due to
change." (As read)

If we knew exactly the laws of nature and the situation of the universe at the initial moment we could predict exactly the situation of that same universe at a succeeding moment. But even if it were the case that the natural laws had no longer any secret for us, we could still only know the initial situation approximately.

However, if that enabled us to predict the succeeding situation with the same degree of approximation that's all we require and we would say the phenomenon has been predicted. But we have now discovered it is not always so. It may happen that small differences in the initial conditions produce very great differences in the final phenomena. A small error in the former will produce an enormous error in the latter which then becomes impossible --

THE CHAIRPERSON: Mr. Edwards --

MR. EDWARDS: -- and we have the fortuitous phenomenon.

THE CHAIRPERSON: Mr. Edwards, if I could begin? I'm sorry, but we do have -- we

are out of time. So if you could sum up quickly, please?

MR. EDWARDS: Okay. What I am claiming, and I say this as a mathematician who has been involved in the study of mathematical sciences throughout Canada for the Science Council of Canada, at which time I discovered that the Economic Council of Canada had a model that had predictions that were wildly inaccurate under certain circumstances, I do not believe that we have the capability to predict the future over such enormous lengths of time. As such, we do not have the scientific legitimacy to abandon these wastes. We must keep an eye on it and see what happens as the future evolves.

Thank you.

--- Applause / Rires

THE CHAIRPERSON: Thank you very much.

Panel Members, did we have some questions? Dr. Muecke...?

MEMBER MUECKE: This is to CNSC. We just heard from Dr. Edwards about the contamination during the Bruce A refurbishment

and workers being exposed to inhalation of plutonium-contaminated dust.

Could CNSC confirm this and how was this incident dealt with and how and when was the incident communicated to the workforce?

DR. THOMPSON: Patsy Thompson, for the record.

There was an alpha contamination event at the Bruce nuclear power plant during some refurbishment activities. The CNSC found out about the event through the reporting system that is in place as part of the licence for unplanned exposures.

I will ask my colleagues, Christina Dodkin and Melanie Rickard, to explain the event and essentially the regulatory actions that CNSC took and the communication and the oversight of communication between Bruce Power and the workers.

MS RICKARD: Good afternoon. My name is Melanie Rickard. I'm a dosimetry specialist with the CNSC.

Yes, the events were reported to the CNSC initially in 2009, and immediately CNSC took action. A request pursuant to section 12(2)

of the general regs was issued to Bruce Power and to all the nuclear power facilities to ensure that workers were -- measures were put in place so that workers were immediately protected.

Over the course of several years CNSC staff actually presented several CMDs in open Commission hearings on this topic. Essentially, major programmatic changes were recommended to the industry and some of those programmatic changes -- there were actually 17 in total -- include things such as zoning, dosimetry, instrumentation, training, monitoring. There are several others which I can share with you if you would like the entire list of the 17 correction actions.

But essentially those corrective actions were put in place to meet two goals. The first is to ensure that workers are protected and the second was to ensure that alpha dosimetry hazards are being assessed appropriately and that the characterization is being done appropriately so that best practices are being followed at all times.

Since the closure of the event, a retrospective dosimetry assessment was done and

doses to all the workers were ascertained and submitted to our National Dose Registry.

THE CHAIRPERSON: Dr. Muecke, did you have a follow up?

MEMBER MUECKE: Yes. A little bit of -- how was it possible for this to happen in the first place? What knowledge gap existed that allowed it to happen?

MS RICKARD: Essentially, the reason why the event happened was when they went into the system and opened it up as part of the refurb activities, they weren't -- they had not appropriately characterized the hazard. They had not foreseen that the hazard would be there. They had assumed that other checks and balances were in place that would prevent such an event.

And while they were doing the work the air monitors did pick up contamination that was related to alpha contaminations. At that time they realized that they obviously had not expected those types of contaminants to come out of the system.

This was when the report was event -- excuse me -- the report was made to the CNSC and the 12(2) was immediately issued to

ensure that staff were immediately protected onsite and then a series of corrective actions followed after the investigation was complete. But essentially at a high level, the risk was not appropriately characterized at that time.

And since this time the CNSC has taken these lessons learned and shared with the international community. Essentially after this event, after the implementation of the lessons learned, Canada is now leading the way in ensuring that alpha hazards are appropriately characterized at nuclear power plants around the world.

THE CHAIRPERSON: Thank you very much, Dr. Edwards. If you could, if possible, stay on the line because we're now going to be entertaining as many questions as possible from the registered participants.

But I note that it is already six p.m. so I reiterate my request to keep your questions succinct and on the topic of today's presentations.

If we could please begin with questions from the Saugeen Ojibway Nations?

MR. MONEM: Alex Monem, for the

record.

Thank you, Madam Chair. Maybe this first question can be directed to CNSC.

A number of the presentations today assessing the WIPP incident focused on the degradation of the safety culture. And we've heard that the OPG culture doesn't share a lot of the same features that would cause or are susceptible to this degradation.

The question I have for the CNSC is whether the key feature of OPG's safety culture are required under legislation and regulation or are these voluntary features and whether or not CNSC has done analysis of the Department of Energy's legislative framework and regulatory framework to determine whether or not the incident at WIPP was the result of non-compliance with those regulations.

THE CHAIRPERSON: Thank you, Mr. Monem.

CNSC...?

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

I'll answer Mr. Monem's last question first. It seems easier.

So the CNSC has not done an evaluation of the Department of Energy's requirements and regulations in terms of safety culture. We have assessed the reports that are available from the investigation boards and have drawn conclusions in terms of what our expectations are that we did not see as the board had highlighted deficiencies.

In terms of the CNSC it is does require all licensees to have management systems implemented and in the modern management systems standards there are requirements for safety cultures. The CNSC was probably one of the first nuclear regulatory agencies to have safety culture assessments and the development of requirements in the nineties following some of the initial work done by the IEA on this subject. The CNSC does expect licensees to conduct assessments of their safety culture and we do follow up on the findings and the corrective actions.

So to answer Mr. Monem's question, it is a regulatory requirement. It is not voluntary.

THE CHAIRPERSON: Thank you.

Mr. Monem...?

MR. MONEM: We heard Scott Travers say that the Society of Engineers negotiated for higher safety standards that required -- than were required by legislation. We've also heard CNSC use the phrase "we would require OPG to consider the implementation" of various things.

So what I'm trying to get at is if there are key features of a safety culture, it would be helpful for us to understand which of these are actual requirements that we could understand as being durable rather than ad hoc or voluntary processes that could change as the corporation might evolve in the future 20, 30, 40, 50 years down the road while we still are going to require this top flight safety culture.

THE CHAIRPERSON: Dr. Thompson...?

DR. THOMPSON: Patsy Thompson, for the record.

I'll provide an initial response and then I'll ask Dr. Harrison to speak to some of the characteristics of a safety culture, elements that the CNSC requires and looks for in

licensees' safety culture assessments.

But just to come back to Mr. Monem's first point in terms of a statement made by the union representatives in terms of them having negotiated a higher standard of safety, our understanding is this refers to the occupational health and safety programs and when we talk about safety culture it's much broader than occupational health and safety. I think that's one of the points that Dr. Harrison will cover.

But just to make sure that you know occupational health and safety is important and it's something that the unions have essentially negotiated with OPG for some other mechanisms that isn't necessarily just meeting the letter of the law. But when we talk about nuclear safety culture it's much broader.

I'll ask Dr. Harrison to provide some of that information.

MS HARRISON: For the record, my name is Felicity Harrison and I'm a human factors specialist.

Yes, we expect that licensees demonstrate characteristics that are seen as what

are evident of the traits of a healthy safety culture.

INPO, the Institute of Nuclear Power Operations, has documented very clearly 10 general traits of safety culture grouped into three categories and within those traits they have illustrated the behaviours that one would expect to see in organization that has a healthy safety culture. I can just read the 10 traits: personal accountability, questioning attitude, effective safety communication, leadership safety values and actions, decision making, respectful work environment, continuous learning, problem identification and resolution and environment for raising concerns and appropriate work processes.

Now, licensees like OPG have in place processes that can address all of these traits obviously in various ways depending on the traits.

What we also require and, in fact, we're writing regulatory documentation guidance on this right now, is that licensees will be in the future, expected to do safety culture self-assessments.

Ontario Power Generation already

does those on, I believe, a three-year rotating basis. And what they -- the way they do that is they use the traits for a healthy nuclear safety culture as the framework. They then do their assessments using tools like interviews, a survey, focus groups, field observations, document reviews. They then take the results of that and compare it with the traits of a healthy safety culture.

Now, from that they can of course then get a picture of how they stand in terms of what the industry has seen reflect an organization with a healthy safety culture. So we would expect that these traits are continued in perpetuity by the various programs that are in place to address the various traits.

DR. THOMPSON: Patsy Thompson, for the record.

Dr. Swanson, if I could add, a detailed -- the CSA Standard N286 that is currently in the licence conditions of the CNSC does speak to requirements for a safety culture. The regulatory document that Dr. Harrison has just mentioned is a document that CNSC is drafting to provide guidance on what we are

looking for in terms of assessment of a safety culture.

THE CHAIRPERSON: Mr. Monem...?

MR. MONEM: I have one more short question, Madam Chair.

There is general consensus that the Department of Energy does not yet know the root cause of the radiation event. We assume that we're going to get more and more information on this and it seems like this is critical information.

A question to CNSC is: How is CNSC going to take this information and make it available to the public, to stakeholders and potentially to this Panel in order that it can factor into not only the decision the Panel has to make but, quite possibly, downstream regulatory processes?

And a related question is could we find out something from the final results of that DOE analysis that would require a substantial new analysis of either the Waste Acceptance Criteria or accident and malfunction scenarios or other kinds of key features of the application?

THE CHAIRPERSON: Dr.

Thompson...?

DR. THOMPSON: Patsy Thompson,
for the record.

Much of -- sorry, I'll try again.
Much of the discussions today in terms of the WIPP events speak to the operational phase of the DGR when waste started to be in place. The assessments that have been conducted and presented to the Panel for the Environmental Impact Statement speak to the normal operations, accidents and malfunctions during site preparation and construction. We have covered operations and then the later phases of decommissioning and closure.

Much of the information that we have seen to date from the investigation reports we have assessed in terms of lessons learned from a regulatory perspective and looking at what -- and we reviewed OPG's programs -- has been identified in the EIS and licence application.

Continuing and moving forward, the expectation is as the investigation reports become available, the final reports when we have more information on the root causes that the CNSC

will do a similar assessment for lessons learned from a regulatory perspective. We also expect OPG using their OPEX program to do the same type of exercise.

The expectation is that -- and we've talked about it last year in terms of phases -- if the project goes ahead and the Panel grants a licence, there is a requirement for OPG to update the safety assessment and the safety case as different types of information become available.

So for taking fully into consideration the events at WIPP in terms of the consequences of accidents and malfunctions for the operational phase, we would expect that the updated safety case from -- that OPG would be submitting with their licence application for an operating licence would be the time where all of that information would be consolidated. But anything that would come between now and then, we would take moving forward to make sure that our regulatory requirements are appropriate for this type of operation.

The other question I didn't -- and my colleagues are pointing -- how the CNSC

would make the information available to the public and the Panel, we can make a commitment to -- as we made our assessments today available to the Panel in a public document, we could make a commitment to make our assessment of the next phases of the investigation reports public on the CNSC website.

And should the Panel still be in deliberation that information would be available to the Panel as well.

THE CHAIRPERSON: Thank you, Dr. Thompson.

Okay. Let's proceed then quickly, please, with the remaining registered participant questions beginning with Mr. Mann.

MR. MANN: Thank you, Dr. Swanson.

How can the OPG/DGR process continue without a brand new safety case after a final and complete WIPP DGR investigation determines what actually happened, especially when no safety culture can be perfect and prevent human error and accidents?

We citizens of Bruce County don't want to be a future Carlsbad, New Mexico with

WIPP and be a model for lessons learned because we've had the WIPP disaster here.

THE CHAIRPERSON: I'll direct the question to CNSC in terms of proceeding with the established safety case. Perhaps, Dr. Thompson, if you can reiterate an earlier point very quickly, please.

DR. THOMPSON: Patsy Thompson, for the record. I will, but if you will allow me, Dr. Swanson, we've heard on more than one occasion today the disaster at Carlsbad and I don't want to downplay the events at Carlsbad. When we were meeting yesterday to prepare for today many of us had comments and objectives like, this is appalling, it's a situation that is beyond reasonable in terms of the findings of the investigations to date.

Having said that, we all have to remember that doses to members of the public from that event are 0.001 mSv per year and doses to workers, although it was an unplanned exposure, were also quite low.

Having said that, the expectation is that, as we've mentioned, that OPG continues to review the events at WIPP and look at OpX in

terms of their operational practices, anything they can learn from and include in their updated programs. The CNSC will continue to do the same thing.

But right now, nothing that we've seen at the WIPP would require significant changes to the programs, the mitigation measures that have been identified by OPG in their EIS for the operational phase which is the equivalent of the WIPP phase right now.

And we continue to believe that OPG will make the right provisions and update the safety case with the information as it becomes available, and certainly the CNSC will expect that update to take into consideration the events at WIPP or anywhere else that might be relevant for this phase.

THE CHAIRPERSON: Thank you. Mr. Mann, very quickly, please.

MR. MANN: The New York Times has indicated that WIPP may never open again. So do we want to spend billions of taxpayer dollars on something that's going to, I call a disaster, a catastrophe that will shut down within 15 years.

THE CHAIRPERSON: That was not a

question, so thank you.

Can I proceed to Mr. Gibbons, please?

MR. GIBBONS: Thank you, Madam Chair. Pat Gibbons, for the record. Lise Morton, OPG, very early this morning indicated that safety incidents are reported to CNSC by nuclear operators.

I recently read an S-99 report on the 2013 safety incidents at Pickering Nuclear Power Plant where 56 fire safety violations were reported. Very briefly, some of them included missed or late fire drills, malfunctioning fire extinguishers, malfunctioning public address system, fire door impairment, storage of combustible material in fire zones, workers smoking in unsafe areas and undue delay in carrying out repairs.

Could OPG or CNSC disclose how many fire-related events, incidents, deficiencies were reported not only from Pickering, but Darlington and the Bruce as well in 2013?

THE CHAIRPERSON: I'll start with OPG.

MS SWAMI: Laurie Swami, for the

record. I believe that the intervener is referring to publicly available reported reports; that is done routinely from all of our facilities when there such events.

As Ms Morton described this morning, obviously equipment can fail, there can be issues. We look at those, we report them to the CNSC. As she stated this morning, those do get investigated and corrective actions are put in place to fix those events.

I don't have the specific numbers, however, it is certainly part of the public record and readily available on our website where one could go and look at the S-99 reports that we have filed.

THE CHAIRPERSON: CNSC, would you please comment on this and I think, in particular, with respect to what we just heard from your expert in terms of the safety culture expectations and whether or not that number of incidents/concerns/deficiencies was of any concern to the CNSC?

DR. THOMPSON: Patsy Thompson, for the record. We obviously don't have -- not obviously, none of us have the information on the

specific S-99 report that Mr. Gibbons referred to, but we can confirm essentially the statements that OPG made in terms of the process followed by licensees that the CNSC expects them to follow and the follow-up that CNSC does in terms of ensuring that corrective actions are taken and closed.

I will ask perhaps Dr. Harrison in relation to your question to talk about the reporting and the station condition records that are used by the facility and the trending that is done and the significance of this in relation to a healthy safety culture.

DR. HARRISON: For the record, my name is Felicity Harrison and I'm a human factor specialist.

Yes, licensees have programs and, in fact, encourage staff members to report events even though they may seem to be of low significance.

In general, one would have a large number of lower significance events and fewer number of high significance events.

The reason that this is encouraged is that it allows the organization,

which would be a learning organization, to examine those low significance events, and they can be things that you and I may think doesn't really have -- is not a problem, but in the nuclear industry the bar for safety is much lower, so the more sensitive to issues.

So they will look at the very lowest events even, try to find where the weaknesses may lie, address those weaknesses while they're still small weaknesses so as to avoid greater significance problems.

So a learning organization such as is Ontario Power Generation, as is evidenced by their programs, encourages the reporting through station condition records of low significance events which are then either addressed, depending on the level of the significance of the events, they can be addressed and corrective actions put in place or they can be trended.

When you trend events you can identify systemic problems, problems either with process or procedure or something like that and then you can address that.

So by using this lower level,

lower significance information, of which there is a fair bit, you can then identify weaknesses in your organization, improve them, strengthen the organization, and all of this is evidence as part of a healthy safety culture. A safety culture -- a healthy safety culture is one that is looking to address weaknesses so that they can strengthen and improve themselves.

THE CHAIRPERSON: Mr. Gibbons, are you...? Thank you. The next question was from Mr. Storck.

MR. STORCK: My goodness. Madam Chair, thanks for inviting me to ask my question.

I am talking tomorrow. I will embed my question tomorrow in what I say in the interests of the fact that it's 6:20.

Thanks.

THE CHAIRPERSON: Thank you. We all appreciate that. Mr. Greening...?

DR. GREENING: Thank you. For the record, I'm Frank Greening. This is directed at the CNSC and what I would like to say is that I wrote to the CNSC in January, 2010 and I also wrote to Bruce Power about the alpha contamination incident that occurred in Bruce in

Units 1 and 2 in December of 2009 and I was totally ignored by the CNSC. I've never received any correspondence from the CNSC to this day about that incident.

But the truth about that incident is that it was definitely due to a degraded safety culture because the rad protection staff knew about the alpha contamination problem and ignored it in the interests of production because they were under pressure to get the grinding of the feeder pipes finished.

So I would like -- I would ask the CNSC to comment.

THE CHAIRPERSON: Dr. Greening, I wasn't quite sure what your question was in there.

DR. GREENING: My question is, would the CNSC confirm that that is, in fact, the true story about what happened.

They say that they didn't know or they say -- they have a different story. I would like them to confirm my story. I believe that is a question.

THE CHAIRPERSON: Dr. Thompson...?

DR. THOMPSON: Patsy Thompson, for the record. I'm going by memory because it's been a while and there's a number of Commission member documents that the CNSC provided to the Commission on these events so, if needed, we can go back tomorrow and bring forward --

DR. GREENING: Okay.

DR. THOMPSON: -- some information. My recollection is that when the events happened there was air sampling going on and the measurements were being compared to a ratio of two radionuclides, and I can't remember the names of those radionuclides, but the ratio of those radionuclides had been developed from historical information and was used as the basis for predicting the presence or absence of some alpha particles.

The events at Bruce indicated that ratio was not always appropriate and not always a good indicator of the presence of alpha contamination. On that basis, the CNSC did a fair amount of investigation. We also got information from our international colleagues to develop requirements for alpha monitoring programs.

The CNSC also did a research project through our research and support program to better understand the presence of various radionuclides and particles and understand the relationship between those radionuclides so that we could have a better sense of the appropriateness of the ratios ever being done for monitoring purposes and for work control purposes.

THE CHAIRPERSON: Dr. Thompson, the panel just heard Dr. Greening make a rather worrisome statement in terms of the degraded safety culture. Could you please comment?

DR. THOMPSON: Patsy Thompson, for the record.

If you would allow me, I can come back during the day tomorrow to address that issue better. I don't have the information now that I could use.

THE CHAIRPERSON: Thank you.

Was that all of your questions, Dr. Greening?

DR. GREENING: That was hardly an answer, but I could also ask about, with regards to the lessons learned for the WIPP accidents,

OPG and the CNSC both claim that no additional controls or changes to procedures are required for the DGR. However, how can they say that when no one knows what caused the radiological release event? How is this lack of an explanation possible more than six months after the event? Surely, this shows that there is a serious lack of understanding of the chemistry of the wastes that are being stored in the WIPP, and I would suggest that the same lack of understanding applies to OPG.

THE CHAIRPERSON: Dr. Thompson?

DR. THOMPSON: Patsy Thompson,
for the record.

What we did in terms of the assessment of the board reports that are available to date is look at the information on the causal factors and the other information that's available. We've identified deficiencies in a number of programs. We've talked about training, for example, procedures, safety culture. We've identified a number of them. What we've done to date is review how OPG assessed the WIPP information and looked at their OPEX program. We've also reviewed the

documentation they've submitted to date with their licence application in terms of their management system manual, their emergency response and preparedness programs and all the other programs, noting that the programs that would be required for an operating licence where radioactive material would be handled are not yet available. We recognize, and I think I've mentioned it early this morning before we got into our presentation, is that what we have to date is with the information that's available we will continue to review the WIPP events as more information becomes available.

What we also did is review the incidents at WIPP, a fire and a breach of a container, and looked at whether similar types of scenarios had been considered in the EIS in terms of the assessment of consequences of accidents and malfunctions, so we did confirm that those types of scenarios were analyzed, and the mitigation measures identified for those scenarios in the EIS were appropriate.

THE CHAIRPERSON: Thank you.

Dr. Greening, perhaps just one more question, please, for now.

DR. GREENING: I would like the CNSC to tell me what they think happened inside that container. Why was it over-pressurized and why did it release radioactivity? Surely they must have some idea.

THE CHAIRPERSON: Dr. Greening, the panel has already heard from CNSC that they are waiting for the phase 2 report. They're not privy to any more information than any of the rest of us are, so I'm afraid that's not a question that can be answered at this time. I'm sure you will get the same response from OPG.

DR. GREENING: Well, I can ask OPG.

THE CHAIRPERSON: If you'd be good enough to try, Ms Swami, you can respond.

MS SWAMI: Laurie Swami, for the record.

As you have stated, we have similar information that's available publicly. We also note that there is a phase 2 report planned and we too are waiting for the results of that phase 2 report so that we can do an assessment of the impact that would have on our facilities, whether that would be the Western

Waste Management Facility today or future DGR operations.

I would also note that we have done a gap analysis to look for any areas for improvement and of course that's an important part of our program. We will continue to do that with this event or any other event that would be applicable to waste management.

THE CHAIRPERSON: Thank you.

Ms Tilman.

MS TILMAN: I will save a couple of my questions for tomorrow as well when I present, but I do have a question and I think it goes to either CNSC or OPG.

The phase 1 report that was released by DOE in April of 2014 that looked at identified degraded safety culture and issues to deal with workers, at the same time, though, I believe it was CNSC, it could be OPG, there was also criticism levied regarding the regulatory framework that DOE calls the shots, writes the reports, et cetera, so I am asking whether OPG and/or CNSC have done a critical analysis of the phase 1 report and its conclusions before adopting the conclusions a priori doing an

analysis and an independent analysis.

THE CHAIRPERSON: I'll start with OPG.

MS SWAMI: Laurie Swami, for the record.

I believe the intervener is asking whether we could independently assess the work that was done by the accident investigation review board, if that is correct, if I understand the question correctly.

THE CHAIRPERSON: Ms Tilman, if you could clarify a little bit. I am struggling too, I must confess.

MS TILMAN: I guess I was tired. In terms of the findings of that report, that it was degraded safety culture, has OPG or CNSC accepted those findings, particularly in light of the criticism that has been presented about the regulatory framework regarding DOE's control? In other words, have they done an objective look at that report and can they say: we agree that is the result of whatever the phase one report conclusion; we agree with their conclusion. Are they comfortable with agreeing with their conclusion? Do they really feel that was a

degraded safety culture issue that caused the incident?

THE CHAIRPERSON: Ms Swami.

MS SWAMI: Laurie Swami, for the record.

I'm still struggling a little bit with agreeing or disagreeing with the conclusions. We've read the report. We've visited the WIPP site to get insight into what happened in those particular events so that we could learn from them.

I must say that as a nuclear company a degraded safety culture is one of the -- I would say a very poor performance on a nuclear company, so for a company to come out and publish a report that says there was degraded nuclear safety culture that resulted in these types of events, that's a pretty significant statement. When we look at this report, we take that as: a significant statement has been issued; we need to respond to that.

Whether we agree or disagree if it's a safety culture issue, there's many other insights in the report beyond the safety culture one that we would use in assessing what we need

to do, if anything, differently because the safety culture is such an important part. We've talked a lot about it today because that speaks to the way we operate our facilities, the way we encourage the safety within our own facilities, but there are other things to learn. There was the learnings on the degraded equipment condition. What caused that? What was the result of that? Some of that was the maintenance activities, some of that was safety culture, but we need to look at that as well, so it's not a matter of assessing whether the people that did the report did it correctly, it's taking the information and applying it to the work that we have in front of us.

THE CHAIRPERSON: Was that sufficient, Ms Tilman?

MS TILMAN: Yes, for now. Thank you.

THE CHAIRPERSON: Mr. Bowden.

MR. BOWDEN: Bill Bowden, with one quick question. Did CNSC or OPG observe any flaws in safety regulations compliance and culture when you visited the WIPP prior to the 2014 incidents and, if so, what changes did you

make to your protocols and practices?

THE CHAIRPERSON: Perhaps could we start with OPG, please?

MS SWAMI: Laurie Swami, for the record.

The visits that were prior to this particular event were for a different purpose, I would say, and not to understand the safety culture but rather to understand just the overall nature of the facilities. There were many tours that were done at that time to understand these things, so while we've heard a lot of discussion of WIPP today, there have been other learnings that we would adopt for our processes going back as far as the Seaborn panel, which we've also heard of today many times of course. There's many things that would be thought through as we were developing this project beyond just the visit to the WIPP before this event took place, so there's many things that would be taken into consideration as we went through that process.

THE CHAIRPERSON: CNSC.

DR. THOMPSON: Patsy Thompson, for the record.

I'll say a few words and then I'll ask Ms Klassen to elaborate on the visit by CNSC staff.

When CNSC staff visited the WIPP and talked to various groups like DOE and the USCPA, it wasn't for the purpose of assessing the regulatory framework in place at the WIPP nor for assessing compliance of the operator with the regulatory requirements, it was more a familiarization visit.

I'll ask Kay Klassen to speak to some of the observations and the purposes.

MS KLASSEN: Kay Klassen speaking, for the record.

Yes, several CNSC staff visited about four years ago, I believe, at this point and it was a familiarization visit. It was to understand the general practices what they were doing at the site, understand from DOE how they conducted their work, how they transported material, what they were doing, what the repository itself looked like, as I said, essentially a basic familiarization, what did such a facility look like, the kinds of activities they were engaged in in a general

sense, not from we do things differently, why are you doing this, what's your specific regulation. It was a familiarization trip.

THE CHAIRPERSON: Thank you.

I guess we didn't stick with the 5:00 p.m. today. We'll see what we can do tomorrow.

Thank you so much to all of you who hung in there to the very end. We'll see you tomorrow morning at 9:00 a.m.

--- Whereupon the hearing adjourned at 6:38 p.m.,
to resume on Wednesday, September 10, 2014
at 9:00 a.m. / L'audience est ajournée
à 18 h 38 pour reprendre le mercredi
10 septembre 2014 à 9 h 00