

DURHAM NUCLEAR HEALTH COMMITTEE (DNHC) MINUTES

Location

Durham Regional Headquarters
605 Rossland Road E, Whitby

Meeting

In an effort to help mitigate the spread of COVID-19, this DNHC meeting was a virtual meeting so that presenters, members, and guests could present and participate without meeting together in the Regional Council Chambers.

Date & Time

June 17, 2022 at 1:00 PM

Members that Participated

Dr. Robert Kyle, Durham Region Health Department (DRHD), (Chair)
Lisa Fortuna, DRHD
Mary-Ann Pietrusiak, DRHD
Dr. Kirk Atkinson, Ontario Tech University (OTU)
Phil Dunn, Ministry of the Environment, Conservation and Parks
Raphael McCalla, Ontario Power Generation (OPG)
Loc Nguyen, OPG
Deborah Kryhul, Public Member
Veena Lalman, Public Member
Janice Dusek, Public Member
Susan Ebata, Public Member
Dr. Barry Neil, Public Member
Jane Snyder, Public Member
Dr. David Gorman, Public Member
Alan Shaddick, Alternate Public Member

Presenters & Assistants

Brian Devitt (Secretary)
Paulo Correia, DRHD (Secretary)
Boris Vulcanovic, OPG (Presenter)
Andy Owen, OPG (Presenter)
Dr. Kirk Atkinson, OTU (Presenter)
Theresa Decker, OPG (Presenter)
Carrie-Anne Atkins, OPG (Presenter)
Chuck Lamers, OPG
Analiese St. Aubin, OPG
Helen Tanevski, DRHD
Pamela Khan, DRHD
Roger Inacio, DRITD
James Kilgour, Durham Emergency Management

Regrets

Hardev Bains, Public Member

Dr. Lubna Nazneen, Alternate Public Member

Dr. Robert Kyle opened the virtual meeting and welcomed everyone.

Dr. Kyle acknowledged Brian Devitt's tenure/service on DNHC. Brian was a member of DNHC when it was formed in 1995, as Director, Environmental Health. After he retired, Brian agreed to serve as DNHC Secretary, a position he has served as for over 20 years. Brian has been steady, reliable, and provided great service over the many years. Brian now gets to officially retire.

Paulo Correia, the new Secretary was introduced to the DNHC. Paulo is an Acting Manager in DRHD's Health Protection Division.

Helen Tanevski, Executive Coordinator of Dr. Kyle, and Roger Ignacio from CS-IT were acknowledged for their support to the DNHC.

Dr. Robert Kyle mentioned that observers who have questions concerning presentations today, should email or discuss their requests with James Kilgour, Director, Durham Emergency Management, at james.kilgour@durham.ca.

James will follow-up with each of the presenters after the meeting with the observers' questions off-line to prevent any duplication of emails and responses. James will report back to Dr. Robert Kyle the outcomes of the questions he received.

1. Approval of Agenda

The Revised Agenda was adopted.

2. Approval of Minutes

The Minutes of April 22, 2022 meeting were adopted as written.

3. Correspondence

3.1 Dr. Robert Kyle's office received the minutes of the Pickering Nuclear Generating Station (NGS) Community Advisory Council meetings held on January 18 and February 15, 2022.

3.2 Dr. Robert Kyle's office received the minutes of the Darlington NGS Community Advisory Council meetings held on January 25 and February 22, 2022.

3.3 Dr. Robert Kyle received a report from James Kilgour, dated May 9, 2022, that James did not receive any questions from observers arising from the April 22 DNHC meeting.

4. Presentations

4.1 Progress Report by OPG concerning its Refurbishment of the Darlington NGS

Boris Vulcanovic, Senior Director, Projects, OPG provided an update on the Refurbishment of the Darlington NGS.

Boris highlighted that Darlington has been in service since the early 90s and has provide over 25 years of power to Ontario. Darlington's design requires a mid-life refurbishment to allow 30 more years of continued operators.

- 10 years of planning and currently in the midpoint of 10 years of executing the refurbishment.

Boris reviewed the refurbishment schedule:

- Unit 2- October 2016 to June 2020
- Unit 3- September 2020 to January 2024
- Unit 1- February 2022 to April 2025
- Unit 4 -September 2023 to October 2026.

Boris continued with the refurbishment scope and vendors involved in the project. Defueling and fuel handling are key pieces in commencing the refurbishment program. The fuel channels, endfittings, and feeders are crucial in running the plant into the future. Turbines, generators, steam generators and associated equipment such as valves, pipes, and electrical systems will be updated. Inspection of equipment also completed during the refurbishment.

Boris reviewed a picture of a mock-up reactor. The mock-up facilitates training, developing work skills, and improvement opportunities for the refurbishment project.

Unit Refurbishment status updates:

- Unit 2 refurbishment completed and has been operating for 2 years. The unit provided a good basis for future planning and execution of subsequent unit refurbishments with the incorporation of lessons learned.
- Unit 3 refurbishment started September 3, 2020. Currently in the assembly phase of putting the reactor back together. Fuel channels are being put back into the reactor. A tool set example was shared which allows both pressure tubes and calandria tubes to be removed simultaneously with automation. The tool allows for fewer material storage containers and for both calandria and pressure tubes to be stored together. The new tool improved the schedule by 30 days. Unit 3 refurbishment is on schedule for March 2024 completion.
- Unit 1 breaker opened on February 15th, 2022. This milestone marked the halfway point in the Darlington Refurbishment Project. It also marked the first time that two units were refurbished at the same time at Darlington. The defueling of the reactor allowed the usage of two of the three trolley systems to be used at the

same time and working in parallel. Bulkhead slabs have been put in place and separate the Unit 1 reactor vault from the station containment structure. The Unit 1 reactor vault airlock doors can now be opened up and proceed into next stages of disassembly of the vault and then the reactor.

- Unit 4 is set to be refurbished as Unit 3 is finished. Unit 1 refurbishment will continue as Unit 4 refurbishment is executed. Project completion on target for end of 2026.

Boris reviewed the collaboration with the multiple companies, trade unions, and organizations involved in the project. 2000 trades people are required to support the remaining refurbishment activities.

Radiation protection and worker safety reviewed. OPG has been working with Bruce Power on a new Dosimetry tool. Reducing and eliminating radiation exposure is a key focus. Additional worker safety initiatives shared.

Boris Vulcanovic or associates will continue to update the DNHC on its progress of the Darlington Refurbishment Project and more information is available at opg.com.

4.2 Progress Report by OPG's Training Programs Team concerning its Continuing Collaboration Agreement with Durham College and Ontario Tech University

Andy Owen, Vice President, Emergency Services and Training, OPG provided a presentation on OPG's Collaboration Agreement with Durham College and OTU.

The collaboration highlights the benefits of providing specific training for skilled trades needed at OPG and for continued education opportunities for OPG staff. Andy reviewed OPG's partnership with Durham College and OTU and included the following highlights:

- The partnership was established in 2005 and mutually beneficial.
- An opportunity existed to work together and advance each other's interest in a beneficial way.
- Partnership is framed around a set of objectives that are revisited regularly to ensure that needs are met.
- The partnership was renewed for another 5-year term ending in 2026.
- There has been a \$20 million investment from OPG from 2005 to 2020. Approximately \$1 million per year has been allocated until 2026.

The objectives of the partnership were explained:

1. Important to attract a diverse group of employees with equity, diversity, and inclusion considered.
- Scholarships have been developed to attract additional candidates to the program.

2. Develop and maintain programs that prepare people for future employment opportunities. An example of the power engineering course and skilled trades programs were highlighted.
 - A new skilled trade center was established at Durham College. New courses also added to the engineering programs to include new emerging technologies.
3. A partner in advancing research. There is a big focus on monitoring and diagnostics of the stations. Research is being conducted to improve the ability to monitor and maintain equipment and for the development of new technology such as the small nuclear reactors. The research helps educate the company and the community.
 - New research collaborations are another benefit of the partnership. Spot the dog, a Boston Dynamic Robot, is being examined to complete inspections in hard-to-reach areas or to reduce radiation exposures.
4. The partnership allows for the development of continuing education programs for OPG.
 - Continuous education courses for staff have been developed. New software application and project management shared as examples of credential programs.
5. There is an opportunity for OPG to support staff and faculty exchanges for professional development. OPG staff are guest lecturers at the college and university. Technical support reciprocated from the schools.
 - The school facilities are used for OPG training.
6. Developed training materials are also used to train other sectors that could benefit from the training provided.
 - Training courses such as the Advanced Operator Overview for Managers also used to train other organizations.

Andy expanded on the training benefits from the partnership.

- The program advisory committee meets to ensure programs offered, align with current workplace needs. Market needs are constantly assessed to develop new content.
- Undergraduate degrees in Nuclear Engineering (B.Eng.) and Health Physics and Radiation Science (BASc) are two examples of new education opportunities for anyone wishing to pursue a specialized field.
- The International Atomic Energy Agency (IAEA) Collaborating Centre was launched at OTU.

Andy expanded on the need for skilled trades and the establishment of the Ontario Power Generation Centre for Skilled Trades and Technology at the Durham College Whitby Campus:

- In April, the grand opening for the Ontario Power Generation Centre for Skilled Trades and Technology at the Durham College Whitby Campus took place. The centre is 60,000 square feet and contains many specialized labs and shops.

- The training capacity of the centre is 750 students. A range of post-secondary and apprentice programs will be hosted such as electrical engineering technicians or mechanical technicians.
- Current demand for skilled trades is immense and future need will intensify. The new centre will assist in addressing the shortage by providing an opportunity to receive the necessary training.

Andy Owen or associates will continue to update the DNHC on OPG's Collaboration Agreement with Durham College and OTU and more information is available at opg.com.

4.3 Progress Report by Ontario Tech University concerning its Faculty of Energy Systems and Nuclear Science

Dr. Kirk Atkinson, Associate Professor and Associate Industrial Research Chair, Faculty of Energy Systems and Nuclear Science, OTU, provided a presentation on OTU Faculty of Energy Systems and Nuclear Science (FESNS).

Kirk provided background information on the OTU. The university was founded in 2002 and opened to students in 2003.

- Enrollment is approximately 10,000 students (9000 undergraduate and 1000 graduate)
- Hosts Canada's only accredited B.Eng. degree in Nuclear Engineering and a BASc program in Health Physics and Radiation Science.
- Ranked #2 in North America for the past three years in terms of nuclear graduates at the Bachelor's degree level with more than 900 since 2007.
- Hosts MASc, Ph.D., M.Eng. and GDip programs in Nuclear Engineering/Technology.
- Delivers the Advanced Overview for Managers Program for OPG.
- FESNS has 14 faculty members with specialties in nuclear engineering, radiation science and energy systems that includes 3 research chairs.

Kirk shared that the OTU is now ranked as one of Canada's top research universities. Number one in Ontario. Number three in Canada among the twenty-one smaller research universities in the country.

In November 2021, OTU launched the IAEA Collaborating Centre for integrated energy systems with advanced nuclear reactors. It is the only IAEA Collaborating Centre in Canada. Activities include the integration of different energy systems:

- Development and deployment of micro and small modular reactors (SMRs).
- Non-electric applications of nuclear energy.
- Nuclear and renewable integrated energy systems for multi-purpose applications (including hydrogen production, energy storage, and applications of process heat).
- Focus on developing, reusing, repurposing, and storing energy.

In March 2022, OTU held a virtual workshop on Integrated Nuclear-Renewable Energy Systems that brought together 700 experts from academia, industry, and international organizations from 75 countries. Hydrogen energy was a focus of the workshop.

The IAEA Centre sits within the newly established Brilliant Energy Institute (BEI). Keeping metrics and data and trying to understand the impacts of different energy systems is a key focus for the institute.

The BEI's mission:

1. Develop and integrate technologies in clean energy systems.
2. Connect technical solutions to social value.
3. Harness the power of collaboration.

The BEI has 5 pillars and includes:

1. Research and Innovation
2. Knowledge and Data Centre
3. Workforce Development
4. Engagement and Collaborative Learning
5. Energy Sustainability

The BEI's recent activities include:

- Jacquie Hoornweg, Executive Director of the BEI, Thought Leadership speaking at events and online events including Globe Forum Vancouver, Canadian Nuclear Society Annual Conference and Ontario Tech's Pi Day of Giving.
- Provided interventions at licencing hearings for New Brunswick Power and Canadian Nuclear Laboratory.
- Partnered with the Canadian Global Affairs Institute.
- Collaborated with others on Net Zero Transition initiatives.
- Provided expert commentary and nuclear advocacy.

Kirk spoke about net zero and types of low carbon energy. In early 2022, a solar photovoltaic façade was installed on the south side of the ACE building. The facade contains 224 panels and produces enough energy to power 10 homes for an entire year. The university is looking at life cycle assessments of different energy solutions.

OTU teamed up with Bruce Power to attract more women into post secondary engineering programs. An internship program for up to 15 women will participate in the program over 3 consecutive summers.

Kirk summarized a research project that was completed by Professor Ed Waller and PhD student Lekhnath Ghimire: *"Estimating lifetime doses to the public living close to nuclear power plants using EPR (electron paramagnetic resonance) measurements on extracted tooth enamel"*. The study looked at tooth enamel as

a biological dosimeter to determine radiation doses from various sources (i.e., natural background dose, x-rays and flying).

Kirk concluded energy resilience and integration is extremely important. The university would continue to provide:

- Outreach and education activities in the local community and beyond.
- More world-leading research in nuclear engineering, health physics, radiation science, and integrated energy systems.
- Exciting developments in new facilities.
- A commitment to generating the workforce and talent needs for the future.
- Thought leadership in clean energy.
- Continue to host and operate a range of radiation sources for teaching and research.

Dr. Kirk Atkinson or his associates will continue to keep the DNHC updated on the FESNS at OTU. More information is available by contacting Kirk at kirk.atkinson@ontariotechu.ca.

4.4 Progress Report by OPG concerning its Centre for Canadian Nuclear Sustainability for Decommissioning of the Pickering NGS (PNGS)

Theresa Dekker, VP Nuclear Decommissioning Program, OPG, provided a presentation on OPG's plan to safely decommission the Pickering NGS.

Theresa provided an overview of the decommissioning plans for Pickering Nuclear Generating Station.

- OPG will shutdown Pickering's units 1 and 4 in 2024 and units 5 to 8 in 2025, pending regulatory approval.
- After commercial operations end, the station will first be placed in a safe storage state (removal of fuel and water) and then begin the decommissioning process in 2028.
- Decommissioning is a multi-decade process with distinct phases which is based on current best practices and technological advances and includes:
 1. Safe storage period starts: 3 years
 2. All used fuel moved into dry storage: 10-15 years
 3. All used fuel removed from site: 25 years
 4. All facilities dismantled and site restored: 40 years

Theresa reviewed the Centre for Canadian Nuclear Sustainability (CCNS). CCNS is intended to be an innovation hub for the collaboration and development of plans for the end of the nuclear lifecycle.

- Plans that focus on the end of the nuclear cycle and components of the cycle: decommissioning, waste stewardship and site repurposing.
- The goal of the CCNS is to bring various partners together.
- CCNS membership includes over 40 partners.

- A slide of all the partners was displayed. Ambassador partners include EnergySolutions, Kinectrics, and SNC-Lavalin. Other levels of membership include Industry Catalyst and Community Partners.

The importance of collaboration for decommissioning planning was shared by Theresa. Points reviewed:

- Studying decommissioning workforce demands to identify future skillsets and addressing gaps in skillsets required.
 - Cavendish Nuclear is identifying the workforce demands for decommissioning.
 - Working with SNC-Lavalin and Canadian Nuclear Laboratories, to share knowledge, opportunities and resources that can be applied to decommissioning plans across the Canadian nuclear industry.
- Learning from two units already in safe storage at PNGS.
 - 2 units have been out of service for 20 years.
 - There are some current projects that are assisting with new decommissioning innovations.
- Exploring international and educational decommissioning opportunities.
 - CCNS was one of the sponsors and participated in the WiN global conference, held in May 2022, in Japan to join a panel on innovations in decommissioning.
 - Working with education partners to develop a course on required competencies.
 - CCNS sits on different committees with IAEA and Nuclear Energy Agency (NEA) with over 34 member countries.

CCNS has been completing benchmarking and looking at decommissioning operating experience. Since the last update, four sites have been visited:

- Indian Point, New York
- Oyster Creek, New Jersey
- Diablo Canyon, California
- San Onofre Nuclear Generating Station, California.

The sites shared their transition planning, community engagement, regulatory affairs, and commercial and technical planning. Sites provided insight on operational experience and lessons learned on radiological environmental safety as well as worker safety during the decommissioning process.

Theresa explained that innovation continues to be a key focus. Several initiatives were shared. The benefits of new innovations include:

- reduce timelines and costs for the decommissioning project,
- enhance employee safety,
- reduce radiation exposure and waste; and
- ensure the safety of the community and environment.

Innovation studies were reviewed and include:

- A strippable coating that can be applied and then removed to reduce unwanted nuclear by-products on disposal material.
 - Contamination removal from concrete, steel, and other surfaces to reduce overall waste is the goal.
- Laser cutting technology for Calandria segmentation.

Theresa mentioned the importance of collaborating with the community and maintaining forums with local councils. CCNS sponsors community initiatives to maintain open conversations with the host community.

Theresa Dekker or associates will continue to update the DNHC on its progress with the Centre for Canadian Nuclear Sustainability. More information is available at <https://theccns.com>.

5. Communications

5.1 Community Issues at Pickering Nuclear and Darlington Nuclear

Carrie-Anne Atkins, Manager, Corporate Affairs, Pickering Nuclear, OPG, provided an update on Community Issues at Pickering and Darlington and the highlights were:

Pickering Nuclear Operational Performance Update

- Pickering Units 1, 4, 5, 6, 7 and 8 are operating at or close to full power.
- On Friday, May 13, Unit 5 successfully synchronized to the grid and as of Monday, May 16 the unit reached 100 per cent full power, marking the end of outage.

Darlington Nuclear Operational Performance Update

- Darlington Units 2 and 4 are operating at or near full power.
- Units 1 and 3 are currently in refurbishment.

New Nuclear Update

- Darlington New Nuclear Geotechnical Study:
 - Starting in mid-May, through September 2022, contractor ES Fox Ltd. will be conducting regular off-shore geotechnical investigations east of Darlington station. The barges will gather samples of the bedrock formation to help characterize the Darlington site for the future construction of a SMR, pending regulatory approvals.
- On June 7, OPG received notification of CNSC Acceptance of the Revised Financial Guarantee for its Darlington New Nuclear Project, which allows the planned site preparation work to begin in the fall.

Safety Update – COVID-19

- OPG's PCR clinic closed May 27th.
- As of Wednesday, June 1, OPG moved to a mask optional policy for all locations across the company.

- As of June 10th, after two and a half years, the OPG Crisis Management and Communications Centre team has stood down.

Other Community Updates

1. Tuesdays on the Trail
 - Summer community program provided for over 15 years.
 - This year, OPG will provide a hybrid model where community members can either attend an activity in person or take the activity kit home with them.
 - The program will run on Tuesdays, July 12, July 19 and Aug. 9, Aug. 16 Alex Robertson Park (Pickering) and the Darlington Waterfront Trail (Clarington).
 - There will be 150 registered spaces available at each location for a total of 300 spaces per day or 1,200 spaces per season. Weekly registration will be offered through www.opg.com.
2. Pickering & Darlington Nuclear Information Centre Reopening
 - OPG's Nuclear Public Information Centres will reopen to the public on Monday, July 4.
 - OPG will continue to follow recommended public health measures, masking advice, and restrictions surrounding COVID-19.

For more information, Carrie-Anne Atkins, Manager, Corporate Affairs, Pickering Nuclear, OPG, can be reached at 416-528-7766 or by e-mail at carrie-anne.atkins@opg.com.

For more information, Lindsay Hamilton, Manager, Corporate Affairs, Darlington Nuclear, OPG, can be reached at 905-914-2457 or by e-mail at lindsay.hamilton@opg.com.

6. Other Business

6.1 Topics Inventory Update

Dr. Robert Kyle mentioned the Topics Inventory will be revised to include the presentations made today.

6.2 Future Topics for the DNHC to Consider

Dr. Robert Kyle mentioned the next DNHC meeting is scheduled for September 16, 2022. The theme of the meeting will be the Annual Environmental Monitoring Results for Pickering and Darlington NGSSs.

2. The Draft Agenda will likely include:
 - Progress report by OPG concerning results of the 2021 Environmental Monitoring Program for Darlington and Pickering Nuclear Generating Stations.
 - Progress report by OPG concerning the results of the 2021 Groundwater Monitoring Program at Darlington and Pickering NGSSs.

- Progress report by Canadian Nuclear Laboratories concerning the Port Granby Project.

6.3 Scheduled DNHC Meetings in 2022

- September 16
- November 18

7. Next Meeting

Location

Virtual Meeting

Durham Region Headquarters
605 Rossland Road East, Whitby

Date & Time

September 16, 2022 at 1:00 PM

7. Adjournment

2:44 PM

Note from Brian Devitt:

After 22 years, I am very pleased with the many issues covered by the DNHC and the many people I was able to meet and network with on these environmental issues. Special thanks to Helen Tanevski and Dr. Robert Kyle for making my responsibilities as Secretary to the DNHC enjoyable.