

DURHAM NUCLEAR HEALTH COMMITTEE (DNHC) MINUTES

Location Durham Regional Headquarters
605 Rossland Road East, Whitby
Meeting Room – Regional Council Chambers

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

Date September 17, 2021

Time 1:00 PM

Members that Participated

Dr. Robert Kyle, DRHD, Chair
Mary-Anne Pietrusiak, DRHD
Raphael McCalla, Ontario Power Generation (OPG) (Presenter)
Loc Nguyen, OPG
Phil Dunn, Ministry of the Environment, Conservation & Parks
Dr. Kirk Atkinson, Ontario Tech University
Janice Dusek, Public Member
Deborah Kryhul, Public Member
Veena Lalman, Public Member
Susan Ebata, Public Member
Dr. Barry Neil, Public Member
Dr. Lubna Nazneen, Alternate Public Member
Alan Shaddick, Alternate Public Member

Presenters & Assistants

Brian Devitt (Secretary)
Carrie-Anne Atkins, OPG (Presenter)
Margo Curtis, OPG (Presenter)
Ali Esmaeily, OPG (Presenter)
Raphael McCalla, OPG (Presenter)
Lindsay Park, OPG
Helen Tanevski, DRHD
James Kilgour, Durham Emergency Management

Regrets

Dr. David Gorman, Public Member
Hardev Bains, Public Member

Jane Snyder, Public Member
Lisa Fortuna, DRHD

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

Dr. Robert Kyle mentioned that Observers who have questions concerning the presentations today, should email or discuss their request with James Kilgour, Director, Emergency Management, at james.kilgour@durham.ca or 905-668-7711 extension 6260.

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

1. Approval of Agenda

The Revised Agenda was adopted as written.

2. Approval of Minutes

The Minutes of June 18, 2021 were adopted as written.

3. Correspondence

3.1 Dr. Robert Kyle received a report from James Kilgour, Director, Durham Emergency Management, concerning Observers' questions received after the June 18 meeting for his follow-up with each presenter related to their presentations. James reported on June 18 and on July 21 that he did not receive any questions from Observers related to the June 18 DNHC meeting.

3.2 Dr. Robert Kyle's office received the *Port Granby Project Newsletter* from Canadian Nuclear Laboratories and Port Hope Area Initiative Management Office. The **newsletter** provided a detailed progress report related to the Port Granby Project as it reaches its final stages of construction, dated Summer 2021.

3.3 Dr. Robert Kyle's office received the *Neighbours Newsletter* from OPG concerning several community issues related to the Pickering and Darlington Nuclear Generating Stations (NGSs), dated Summer 2021.

3.4 Dr. Robert Kyle's office received an invitation, to be directed to the DNHC from Caitlin Rochon, Office of the Chief Administrative Officer (CAO), concerning participating in *Durham's Community Engagement on its First Nuclear Strategy*. DNHC Members and Observers were provided with a link to complete a survey about nuclear emergency preparedness, dated July 30, 2021.

Dr. Robert Kyle mentioned that at the November 19 DNHC meeting, staff from the Office of the CAO will provide a progress report on the development of *Durham's first Nuclear Strategy*.

4. Presentations

4.1 Progress report by OPG concerning the Results of the 2020 Environmental Monitoring Program (EMP) for Darlington and Pickering NGSS

Margo Curtis, Environmental Advisor, Environmental Monitoring Program, OPG, provided a detailed presentation of the 2020 EMP results for Darlington and Pickering NGSSs.

Margo explained the Key Objectives of EMP are to:

- Demonstrate, independent of effluent monitoring, the effectiveness of containment and effluent control.
- Demonstrate compliance with limits on the concentration/intensity of contaminants/physical stressors in the environment.
- Provide data to assess the level of risk on human health and the environment and/or to confirm predictions made by environmental risk assessments.

The highlights of the 2020 EMP presentation were:

- Detailed maps and statistics compiled from 2011 to 2020 for Pickering and Darlington were used to show and summarize:
 - Critical Groups and sampling locations
 - Radiation dose examples for comparison of exposures
 - Graphs of public dose compared to the CNSC legal limit
 - 2020 results of Radioactive Emissions Monitoring
 - Emissions to air and at the site boundaries of NGSSs
 - Tritium at water supply plants (WSP) near NGSSs
 - Results of Non-Radiological Emissions Monitoring
- The results of the 6 Radiological Site Emissions to air and 3 Radiological Emissions to water for both Darlington and Pickering were a very small fraction of its Derived Release Limits (DRLs).
- The main contributors to the 2020 public dose were carbon-14, tritium and noble gases for Darlington, and tritium and noble gases for Pickering.
- The 2020 public dose for Darlington was 0.4 μSv or less than 0.1% of the annual Canadian Nuclear Safety Commission (CNSC) annual regulatory limit and it was consistent with the 2019 public dose calculations.
- The 2020 public dose for Pickering was 1.2 μSv or less than 0.1% of the CNSC annual regulatory limit and it was consistent with the 2019 public dose calculations.
- Laboratory analyses of 916 environmental samples were performed for the 2020 dose calculations.

- The results of 6 Non-Radiological Emissions to air and 2 Non-Radiological Emissions to water for both Darlington and Pickering complied and met all Environmental Compliance Approval limits.
- The estimated annual natural background radiation for both Darlington and Pickering dose is 1,400 µSv.
- The tritium concentrations monitored at WSP near the NGSs remained at a small fraction of the Ontario Drinking Water Quality Standard of 7,000 Bq/L and well below OPG's voluntary commitment of 100 Bq/L.
 - Bowmanville WSP – 4.6 Bq/L
 - Oshawa WSP – 5.9 Bq/L
 - Ajax WSP – 5.0 Bq/L
 - F.J. Horgan WSP – 4.1 Bq/L

To summarize, Margo mentioned:

- Darlington and Pickering NGSs radiological emissions remained at a very small fraction of its DRLs.
- Annual public doses resulting from Darlington and Pickering were both less than 0.1% of the CNSC annual regulatory limit.
- The 2020 public dose calculations and EMP report were reviewed and verified by an independent third party.
- The 2020 EMP report was submitted to the CNSC on April 23, 2021 and it has been available on opg.com since June 28, 2021. The link to the EMP report is opg.com/reporting/regulatory-reporting/.

Margo explained that OPG conducted several other environmental monitoring studies that were referenced in the 2020 EMP report and submitted to the CNSC. The highlights of the studies were:

Thermal Monitoring Programs

- The discharge of warm water through the condenser cooling water (CCW) system has potential to impact spawning success and larvae development of fish species.
- OPG performed a study of the Thermal and Ambient Lake Water Temperature to monitor and to understand the potential impacts from the Pickering and Darlington NGSs discharge of warm water to Lake Ontario.
- The average lake temperature at the Darlington Lake Current Monitor on December 1, 2019 and March 31, 2020 was 2.7 degrees C compared to a no effects threshold of less than 6 degrees C.
- In conclusion, there is no indication of a warming trend that would impact spawning success and larvae development in the near term.

Impingement and Entrainment Monitoring Programs

- Pickering Fisheries Act Authorization authorizes the impingement and entrainment of fish resulting from the operations of the CANDU reactors.
- In 2019, the impinged biomass was estimated to be 15,114.5 kilograms or 2.87 kilograms per million cubic metres of station flow.

- The 2020 biomass Impinged Report was submitted to the CNSC on May 25, 2021.

Margo mentioned OPG staff are 'looking ahead' to other studies in 2021:

- A 2019 supplementary study on hydrazine concentrations in lake water at the outlet of the Darlington diffuser was to analyze the results using a lower detection limit. This study was designed to remove uncertainty surrounding human exposure to hydrazine through drinking water and fish ingestion.
- A 2019 supplementary study on the filtered and unfiltered concentrations of aluminum in the Darlington CCW was to clarify the risk to ecological receptors in Lake Ontario.
- The updated data from these 2019 studies have been included in the next iteration of the Darlington Environmental Risk Assessment which will be publicly available in the 4th quarter of 2021.
- In January and September 2020, the Ministry of the Environment, Conservation and Parks, performed audits of the Health Physics Laboratory. There were no non-compliant findings for either audit. Overall, the inspection rating for both audits was 100%.

Margo Curtis or her associates will update the DNHC next year with the 2021 EMP report results. For more information on EMP, Margo can be contacted at margo.curtis@opg.com.

4.2 Progress report by OPG concerning the Results of the 2020 Groundwater Monitoring Program (GWMP) at Pickering and Darlington NGSs

Ali Esmaily, Section Manager, Environment Programs – Nuclear, OPG, provided a detailed presentation of the results of the 2020 GWMP at Pickering and Darlington NGSs.

Ali explained the key objectives of the 2020 GWMP were to:

- Verify groundwater flow direction.
- Monitor changes to on-site groundwater quality to identify new issues in a timely manner and assess historical issues.
- Monitor groundwater quality at the site boundary to confirm there are no adverse off-site impacts.

Pickering NGS highlights of the 2020 GWMP:

- 244 samples were collected from 104 sampling locations to analyse groundwater to characterize groundwater conditions and trends. The key locations/areas monitored were:
 - Upgrading Plant Pickering area
 - Units 1 and 2 and the Vacuum Building areas
 - Units 3 and 4 areas
 - Units 5 and 6 areas
 - Units 7 and 8 areas

- Units 1 to 4 Irradiated Fuel Bay areas
- Units 5 to 8 Irradiation Fuel Bay areas
- Site Boundary

Ali provided overview-maps of these key locations/areas that were monitored along with detailed graphs showing the laboratory results from 2009 to 2020. The results demonstrated the overall trends of tritium in the groundwater for the key locations/areas have trended down or remained constant.

Ali mentioned the 2020 GWMP confirmed:

- The groundwater flow direction has remained consistent with previous interpretations.
- Monitoring of the site boundary groundwater quality results showed no indication of any adverse off-site migration of tritium from the Pickering NGS site.

Darlington NGS highlights of the 2020 GWMP:

- 160 samples were collected from 81 sampling locations to analyse groundwater samples to characterize groundwater conditions and trends. The key locations/areas monitored were:
 - Near Reactor Building areas
 - Site Boundary

Ali provided overview maps of these key locations monitored along with detailed graphs showing the laboratory results from 2009 to 2020 that confirmed:

- The groundwater flow was consistent with previous interpretations.
- The site boundary groundwater quality monitoring indicated that there was no adverse off-site migration of tritium from the Darlington NGS site.

To summarize, Ali mentioned:

- The Pickering and Darlington groundwater flow pattern remained consistent with original interpretations.
- The Pickering and Darlington groundwater data collected from key areas indicated that tritium concentrations remained constant or decreased and that demonstrated stable or improved environmental performance.
- In 2019, the Pickering emerging groundwater issue identified at Unit 8 involved implementing corrective actions including on-going monitoring and the results were stable in 2020.
- At Darlington and Pickering, there was no indication of adverse, off-site migration of tritium from the NGSs in groundwater.
- The 2020 GWMP results for Pickering and Darlington NGSs were submitted to the CNSC for its review and comment.

OPG has developed GIS maps for both Pickering and Darlington NGSs. The GIS maps make it easier for the public to see the trends and help understand the groundwater monitoring results. A GIS map system was initially developed

for Pickering NGS and OPG followed-up with one for Darlington NGS. Both GIS maps are now available for use on the www.opg.com under Regulatory Reporting.

Ali Esmaeily or his associates will update the DNHC next year with the 2021 results of the GWMP for the Pickering and Darlington NGSs. For additional information, Ali can be contacted at ali.esmaeily@opg.com.

4.3 Progress Report by OPG concerning the effect the Tritium Removal Facility (TRF) at the Darlington NGS has in Minimizing Emissions and the effect on the Public Dose

Raphael McCalla, Director, Environmental Health and Safety, OPG, provided a detailed presentation on the TRF and its effect on minimizing emissions from the Darlington NGS.

Raphael provided a list of important tritium facts:

- Tritium is a radioactive form of hydrogen that occurs both naturally and as a by-product of the operation of CANDU nuclear reactors.
- One of the more common uses of tritium involves glow-in-the-dark lighting, airport runways emergency lighting, signs etc.
- Tritium exposure can pose a health risk if it is ingested through drinking water or eating food and if it is inhaled or absorbed through the skin in large quantities.
- The CNSC regulates releases of tritium from nuclear reactors and the TRF to ensure the health and safety of workers, the public, and to protect the environment in case of spills of heavy water.

Raphael provided a description of the TRF:

Upgrader

- Increases the isotopic of heavy water from reactors.
- Unit operations must be within CNSC licensing limits.
- Improves the economic efficiencies of the reactor.

Removal Facility

- Removes the tritium from heavy water.
- Key to maintaining reactors operating within CNSC licensing limits.
- Keeps the public dose ALARA.
- Minimizes tritium emissions to air and water.

Detritiation

- The Darlington TRF is the largest in the world.
- Approximately 100,000 curies of tritium are removed per day of operation.
- The TRF is available to all OPG reactors, Bruce Power and other nuclear facilities in Canada.

Commercial Services

- Tritium removed is stored and OPG is able to sell it for use in exits signs, airport runways, biomedical research etc.
- Tritium is provided to other nuclear facilities in the US, Japan, Norway, Denmark, Germany, Italy and France and used for nuclear fusion research such as the International Experimental Thermonuclear Reactor (ITER).

Annual Monitoring of Radiological Emissions from the Darlington TRF includes calculations for:

- Noble gas
- Carbon-14
- Annual air emissions
- Annual water emissions
- Tritium oxide
- Gross beta/gamma

Raphael summarized the Environmental Benefits of the TRF:

- By reducing the concentration of tritium in the Primary Heat Transport and Moderator Systems, it helps reduce tritium emissions to workers, the public and the public dose calculations.
- In Canada, members of the public receive an annual dose of radiation from tritium of approximately 0.0001 to 0.013 millisieverts (mSv).
- Near nuclear facilities, where tritium levels are slightly higher, the average annual dose to the public is approximately 0.0015 mSv.
- These doses are well below the public dose limit of 1.0 mSv as set in the Radiation Protection Regulations.
- The average annual Canadian dose due to natural background radiation is 1.8 mSv.

Raphael McCalla or his associates will keep the DNHC updated on OPG's EMPs being conducted at Pickering and Darlington NGSs. For more information on the Darlington TRF, Raphael can be contacted at raphael.mccalla@opg.com.

5. Communications

5.1 Community Issues at Pickering Nuclear

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

- Pickering Units 1, 4, 5, 6 and 8 are operating at or close to full power.
- Pickering Unit 7 is in a maintenance outage.
- Pickering hosted the COVID-19 modified *Tuesdays on the Trail – PowerON Tuesdays Program* in July and August over four weeks in nearby public parks with its community partners and it was completely sold out.

Together, they provided free educational and environmental-based activity kits for local families.

Carrie-Anne Atkins, Manager, Stakeholder and Corporate Affairs, Pickering Nuclear, can be reached at 416-528-7766 or by email at carrie-anne.atkins@opg.com for more information.

5.2 Community Issues at Darlington Nuclear

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

- Darlington Units 1, 2 and 4 are operating at close to full power.
- Darlington Unit 3 is undergoing refurbishment.
- Darlington hosted the COVID-19 modified *Tuesdays on the Trail – PowerON Tuesdays Program* in July and August over four weeks in nearby public parks with its community partners and it was completely sold out. Together, they provided free educational and environmental-based activity kits for local families.
- In June 2020, Darlington submitted its application to the CNSC to renew the Darlington New Nuclear Site Application Licence that was granted in 2012.
- In September or October 2021, the CNSC will hold a public hearing to consider the OPG's application of the Darlington New Nuclear Project (DNNP) and no date has been set.
- In November 2021, the DNNP team will provide details about the technology selection for the proposed new nuclear site.
- Tours of the DNNP lands have been provided and other tours planned to host indigenous communities to help build relationships and provide meaningful engagement about the proposed project.
- The DNNP team is planning an update to officials of Durham Region and they will provide a presentation at the next DNHC meeting on November 19.

Lindsay Hamilton, Manager, Stakeholder and Corporate Affairs, Darlington Nuclear, can be reached at 905-914-2457 or by email at lindsay.hamilton@opg.com for more information.

5.3 Corporate Community Issues at OPG

Carrie-Anne Atkins, Manager, Stakeholder and Corporate Affairs, Pickering Nuclear, provided an update on an order issued by the CNSC to OPG on July 27, 2021 related to the operation of the Pickering NGS. The Order was a result of actions the CNSC had taken at Bruce Power recently concerning its safety of the heat transport system and the Commission's Order required OPG to:

- Obtain authorization from the Commission prior to the restart of any its units or following any outage that results in the cool down of Pickering's heat transport system.
- OPG considers this order to be a very conservative action and OPG will continue to maintain the Pickering units fit for service.
- On September 10, 2021, Jon Franke, Senior VP, Pickering Nuclear, Steve Gregoris, Senior VP, Darlington Nuclear, and several senior OPG staff met and presented OPG's perspective on the Order and they made a formal written request of the Commission concerning the Order.
- Copies of the CNSC Order and OPG's formal written request of the CNSC were provided in a covering email with the Draft Minutes.
- The DNHC will be updated as more details and decisions are made available concerning the CNSC Order and any further action.

Carrie-Anne also mentioned:

- The next semi-annual testing of the Durham Region Public Alerting Systems will take place on October 18 and 19, 2021.
- The next edition of the *Neighbours Newsletter* will be mailed in November 2021.

6. Other Business

6.1 Topics Inventory Update

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

6.2 Future Topics for the DNHC to Consider

Dr. Robert Kyle indicated the next DNHC meeting scheduled for November 19, 2021 will likely include:

- Progress reports by the Canadian Nuclear Safety Commission concerning the 2020 Safety and Performance Reports for the Darlington and Pickering Nuclear Power Plants.
- Progress report by OPG concerning the Darlington New Nuclear Site Preparation Licence that expires in 2022.
- Progress report by the Office of the CAO concerning development of *Durham's first Nuclear Strategy*.
- Progress report by Canadian Nuclear Laboratories concerning the Port Granby Project.

6.2 Scheduled DNHC meetings in 2022

- January 21 (TBC)
- April 22 (TBC)

7. Next Meeting

Location Durham Regional Headquarters

Date November 19, 2021

Time 1:00 PM

8. Adjournment 2:35 PM