Pickering Nuclear Generating Station
Community Advisory Council
Virtual Meeting
Minutes, October 20, 2020
Highlights

Site Update
Jon Franke presented a site update. The operating status of the six active reactors on site, OPG's evaluation of small nuclear reactor (SMR) technologies, and the station's high-performance rating from the World Association of Nuclear Operators (WANO) were among the items mentioned.

Environmental Monitoring Program
Raphael McCalla presented the 2019 results of Pickering Nuclear's Environmental Monitoring Program. The program monitors releases of effluent from the station via air and water. The Pickering Station 2019 public radiation dose is extremely small in comparison with the legal limit (0.2% of the annual limit). And it is 0.12% of the annual natural background radiation.

Groundwater Monitoring Program
Raphael McCalla presented the 2019 Pickering Nuclear Groundwater Monitoring Program results. Tritium is the main focus of concern about groundwater at the Pickering site. Groundwater collected from 135 sampling locations indicate that tritium concentrations have remained constant or decreased, which indicates stable or improved environmental performance. There were no indications of adverse off-site impact from Pickering Nuclear groundwater.

Community Update
Analiese St. Aubin presented an update on OPG's involvement in recent and forthcoming community activities: official opening of the Centre for Canadian Nuclear Sustainability; Take Pride in Pickering Day distribution of native shrubs for backyard planting; modified poppy distribution campaign at the site for Remembrance Day; fall testing of the Public Alerting System.

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Pickering CAC:
John Earley
Frank Dempsey
Donna Fabbro
Natalie Harder
Julie Kim
Tracy MacCharles
Pat Mattson
Cody Morrison
Peter Ottensmeyer
Helen Shamsipour
Dan Shire
John Simpson
John Stirrat

Regrets:
Jill Adams
Bill Houston
Tim Kellar
Greg Lymer
Sean McCullough
John Miseresky
Zachary Moshonas
Cameron Richardson

OPG:
Jon Franke
Raphael McCalla
Analiese St. Aubin

Hardy Stevenson Associates:
Francis Gillis
Dave Hardy

Topic #1: Review of Minutes

The CAC minutes from September 15, 2020, were approved without changes.

Topic #2: Site Update

Senior Vice President Jon Franke presented a site update:

- Units 1, 5, 7, and 8 are operating at full power. Units 4 and 6 are undergoing planned outages. Units 2 and 3 are in safe storage.

- There was a recent algae run against the screen at the water intake area of the plant. Extra staff were called on to monitor the situation. They lowered the amount of water coming into the plant and removed the algae.

- OPG has made a commitment to advance engineering and design work of small modular reactor (SMR) technologies. The company has narrowed the search down to three developers. SMRs in the range of 80 to 300 megawatts are considered the right size for various uses in Ontario. There is also an opportunity for SMR usage in the rest of Canada, for example, to help other provinces transition from coal. We will be inviting Robin Manley, Vice President New Nuclear Development at OPG, to come to a future CAC meeting.

- OPG plans to seek renewal of the CNSC site preparation licence for new nuclear at Darlington.

- Unit 4 is at approximately the half way point in its planned outage. Among the activities is work on refurbishment of the steam generators. There was a delay in delivery of certain tools, but the work schedule is still on track.

- At Unit 6, an important activity is the harvesting of Cobalt-60, which is sent to Nordion (Canada) for distribution around the world. (The gamma rays emitted by Cobalt-60 are used in the sterilization and irradiation processes for the medical device, pharmaceutical, food safety and high-performance materials industries.) Additional activities include inspection of the system used to shut down the reactor when required.

- The Nuclear Safety Review Board recently came on the Pickering Nuclear site to conduct their annual review which included interviews with staff and to tour the station. They found no safety concerns and many strengths. There were a few findings and the team will determine how to take action.

- Near the end of last year, Pickering Nuclear received the results of their 2019 World Association of Nuclear Operators (WANO) peer review follow-up. WANO gave the station a performance rating in line with the highest performing

operators in the world. This performance rating is a first for Pickering Nuclear. Darlington has achieved this performance rating in the past. A virtual ceremony recognizing Pickering Nuclear's achievement will be held on Thursday (Oct. 22). Normally, such a ceremony would be held at the WANO centre in Atlanta, Georgia. But that dinner has been cancelled due to COVID-19. However, the Pickering workforce can now participate in the ceremony on line. The ceremony will be live streamed and employees who are not able to watch live will be able to access the link at another time.

Jon responded to Council questions and comments:

- *It's worth noting that the use of Cobalt-60 for medical radiation therapy was developed at Chalk River Laboratories. A Canadian first.*

- *OPG should consider GTE Hitachi's fast neutron reactor which enhances the sustainability of nuclear power and destroys nuclear waste much faster than the thermal reactors now in use.*
  (Jon said he would pass the suggestion on to Robin Manley for his consideration.)

- *When will the two planned outages be completed?*
  The Unit 4 outage is expected to be completed in early December. Unit 6 is expected to be completed by mid-January.

Topic #3: Environmental Monitoring Program (EMP)

Raphael McCalla, Director Environment Nuclear, presented the 2019 results of Pickering Nuclear's Environmental Monitoring Program (Appendix 1). He emphasized that the EMP is based on the work of many individuals.

A key objective of the EMP is to monitor releases of effluent from the station via air and water. In particular, the program demonstrates compliance with regulatory limits on the presence of contaminants and physical stressors in the environment due to plant operations. For example, the Ministry of the Environment, Conservation and Parks (MECP) places limits on the allowable range of temperature change in lake water, which leaves the plant at a higher temperature than when it went in. (A change in temperature beyond the allowable range would have a potential impact on the environment.)

The EMP conducts sampling at specific locations around the Pickering Nuclear. Samples of milk, hair, fruits and vegetables, fish, well water, etc. are examined to assess the impact of station operations on the environment.

Potential critical groups are defined through a site-specific survey, which asks such questions as:

- Do you work in the City of Pickering?

- Do you eat out frequently?
- Where do you get your meat?

Critical groups defined by the survey include the correctional institution, industrial workers, dairy farmers, etc. Surveyors take the top three critical groups and look at the dose they receive. The results are broken down to capture infant, child and adult doses.

Raphael presented a chart compiled by the CNSC giving a dozen examples of radiation dose received from various sources, ranging from:

1,000 millisieverts (dose which may cause symptoms of radiation sickness)

to 500 millisieverts (annual dose limit for emergency workers)

to 50 millisieverts (annual dose limit for nuclear energy workers)

to seven millisieverts (a typical chest CT scan)

to 0.001 millisieverts (typical dose from living one year within a few kilometres of an operating nuclear power plant in Canada).

Raphael presented a 2019 EMP Summary:

- Annual public dose resulting from PN operations was 1.7 microsieverts (μSv), which represents 0.2% of the annual regulatory limit. (A microsievert is one thousandth of a millisievert.)
- Station radiological emissions remained at very small fractions of their respective Derived Release Limits (DRLs).
- Dose calculations and annual report were reviewed and verified by an independent third party.
- 2019 EMP report was submitted to the CNSC on April 27, 2020 and has been available at www.opg.com since June 18, 2020.

Raphael defined Derived Release Limits as action levels set by OPG; DRLs are set at 10 percent of legal limits. He stated that OPG ensures the plant never exceeds DRLs or, if there are exceedances, puts proper mitigations in place. As well, OPG has to report exceedances to the CNSC and indicate how it will prevent such exceedances in the future.

Raphael responded to a couple of Council questions:

- *Do the data referenced in the summary refer to totals for the year?*
  Yes, and that includes emissions to both air and water.

- *What is the allowable range of temperature change in lake water entering and leaving the plant?*

That change cannot exceed 11 degrees Celsius. (Jon noted that lake water taken into the plant does not go through the reactors.)

Raphael noted that the Pickering Station 2019 public dose is extremely small in comparison with the legal limit (0.2% of the annual legal limit and 0.12% of the annual natural background radiation).

He noted that tritium at Water Supply Plants near Pickering Nuclear is at extremely low levels. Annual average concentrations are far below 100 becquerels, which OPG has made a commitment to never exceed at Water Supply Plants.

Raphael also reviewed the results of Pickering Nuclear's non-radiological emissions monitoring. Emissions of hazardous non-radiological materials are well within regulatory limits and have no significant impact on air or water. These emissions are reported to the Ministry of the Environment, Conservation and Parks and to the CNSC.

Other monitoring programs include thermal monitoring and impingement and entrainment monitoring.

The station makes sure that the discharge of warm water through the condenser cooling water system does not impact the spawning success and larvae development of fish species, in particular round whitefish.

A Fish Diversion System barrier net is installed in the lake around the Pickering Nuclear water intake area from April to November. The barrier net helps to limit impingement (fish being drawn against the plant's intake screen) and entrainment (eggs and larvae passing through the intake screen). OPG is required to offset all fish impacted by the intake of station cooling water by taking compensatory steps to enhance the sustainability of fish species.

Raphael noted that the EMP report is verified by an independent third party, and that the CNSC sends its own investigators to look at the station's emissions data.

Topic #4: Groundwater Monitoring Program

Raphael McCalla presented the 2019 Pickering Nuclear Groundwater Monitoring Program results (Appendix 2).

The annual program objectives are 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

Raphael presented a diagram showing groundwater flow direction in and around the station, some of which goes directly to the lake.

In 2019, there were 135 groundwater sampling locations in and around the station, from which 339 samples were drawn. As in previous years, these samples indicate that the impact of plant operations on groundwater represents minimal risk to the environment.

OPG looks at the history of activity in and around the Pickering station to decide which sampling wells should be part of the annual monitoring campaign. Key areas monitored in 2019 include: the Upgrading Plant Pickering Area where heavy water utilized in the reactor core is sent for upgrading; irradiated fuel bays; the vacuum building. The two facilities housing Dry Storage Containers are dry, so they have no impact on groundwater, and there are no wells in that area.

Raphael presented a series of graphs regarding findings from wells in specific areas. Tritium is the main focus of concern. Key findings:

- Upgrading Plant Pickering Area: graph shows a steady decline over the past 20 years
- Unit 1 and Unit 2 and Vacuum Building Areas: no significant increase in concentration of tritium in 2019
- Unit 3 and Unit 4 Areas: concentration remains stable and low
- Unit 1 – 4 Irradiated Fuel Bay Area: concentration remains relatively stable
- Unit 5 and Unit 6 Areas: no significant change in concentration; the spike of tritium in 2017 due to temporary equipment issue, otherwise a steady decline from 2009 through 2019
- Unit 7 and Unit 8 Areas: stable performance 2017 through 2019
- Unit 5 – 8 Irradiated Fuel Bay Area: no significant change in 2019
- Site Boundary Groundwater Quality: no significant off-site impact

Raphael noted that site boundary wells indicate very low tritium impact. Migration speed of groundwater is very low, and there is very little migration off-site. We can be confident that there is no groundwater impact off-site, he said.

Raphael presented a summary of the results of 2019 groundwater monitoring:

- Pickering Nuclear groundwater flow patterns remain consistent with original interpretations.

- Groundwater data collected from key areas indicate that tritium concentrations have remained constant or decreased, which indicates stable or improved environmental performance.
    - There was an emerging groundwater matter identified at the PN Unit 8 area in 2019.
    - Corrective actions undertaken to address the source and monitoring continues.
- There were no indications of adverse off-site impacts from PN groundwater.

Topic #5: Community Update

Analiese St. Aubin, Manager of Corporate Relations and Communications at Pickering Nuclear, presented an update on OPG's involvement in community activities:

- The Centre for Canadian Nuclear Sustainability will officially open on this Friday, Oct. 23. There will be an opportunity for a tour of the new centre at a future CAC meeting.

- For Take Pride in Pickering on Saturday, Sept. 26, we distributed native shrubs (red osier dogwood) to approximately 300 families to plant in their own backyard. This event was organized by a joint partnership between OPG, the City of Pickering and Toronto and Region Conservation Authority (TRCA).

- This year, Pickering Nuclear cannot invite veterans on to the site to distribute poppies for Remembrance Day, so OPG staff volunteers will manage that distribution and collect donations for the Royal Canadian Legion.

- For the fall testing of the Public Alerting System, automated telephone notification throughout the 10km area around the Pickering and Darlington stations will take place on Monday, Nov. 23, and sounding of the outdoor sirens installed within 3km of each nuclear station will take place on Tuesday, Nov. 24.

Topic #6: CNSC News

For selected news items from the CNSC, please see Appendix 3.

Next Meeting
Tuesday, December 1, 2020
Joint Session of
Darlington Nuclear Community Advisory Committee
and
Pickering Nuclear Community Advisory Council