Pickering Nuclear Generating Station
Community Advisory Council
Pickering Nuclear Information Centre
Minutes, May 21, 2019
Highlights

Site Update
Randy Lockwood presented an update on: the operating status of the site reactors; high lake levels and steps being taken to protect the site against flooding; plant inspections by external reviewers; and other developments.

Community Update
Analiese St. Aubin reviewed OPG involvement in recent community activities. Among the items mentioned: Take Pride in Pickering tree planting; a walk for families of workplace tragedy; during Emergency Preparedness Week, co-hosting an information booth with the Durham Emergency Management Office.

Environmental Monitoring Performance (EMP) Report
Raphael McCalla presented the 2018 results of OPG's Pickering and Darlington EMP's. Pickering radiation emissions represent only 0.15 percent of background radiation in the Pickering area.

A Perspective on Small Modular Reactors
Council guest (and Professor Emeritus of Nuclear Medicine at the University of Toronto) Peter Ottensmeyer talked about small modular reactors and their potential to use up used nuclear fuel. He reviewed the industrial history of Pickering and discussed the opportunity for a recycling facility on the Pickering Nuclear site that would draw on used CANDU fuel now in storage at Pickering and elsewhere.

Update on New Nuclear Development
Robin Manley presented an update on New Nuclear Development at OPG. The development mandate includes two parallel paths: maintain the option for the Darlington New Nuclear Project; pursue small modular reactors as part of OPG's portfolio.

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Pickering CAC:
John Earley
Donna Fabbro
Bill Houston
Greg Lymer
Tracy MacCharles
Pat Mattson
John Miseresky
Krupesh Patel
Dan Shire
John Stirrat
Ralph Sutton
Deborah Wiley

Regrets:
Jim Dike
Keith Falconer
Kristin Hall
Tim Kellar
Sean McCullough
Zachary Moshonas
Helen Shamsipour

Guests:
Jill Adams
Frank Dempsey
Julie Kim
Peter Ottensmeyer

OPG:
Randy Lockwood
Robin Manley
Raphael McCalla
Dominique Minière
Art Rob
Analiese St. Aubin

PDA:
Francis Gillis
John Vincett

Topic #1: Review of Minutes

Under Topic #4 of the April minutes, regarding internal communications at Pickering Nuclear, a Council member asked what form of information was provided to employees about the harvesting of Cobalt 60 and the value those materials provide for medical research and clinical therapy. Analiese St. Aubin said the information was provided in a video, which Randy Lockwood said would be presented at the next meeting.

The CAC minutes for April 16, 2019, were approved without changes.

Topic #2: Site Update

Senior Vice President Randy Lockwood introduced Dominique Minière, who recently joined OPG as Nuclear President. Dominique was a leader of the nuclear industry in France for a number of years and has enjoyed a career in the nuclear industry that has taken him to many different countries.

Randy presented an update on developments at Pickering Nuclear and elsewhere at OPG. He began with presentation of a video on the delivery of the Unit 3 stator to the Darlington station. The 350-tonne piece of equipment arrived on May 9th, having crossed the Atlantic Ocean from Poland and travelled through the St. Lawrence Seaway to Oshawa Harbour, where it was craned on to a barge for the final eight kilometres of its journey to DNGS. The stator, a key component of the turbine generator, will be installed during Unit 3's refurbishment in 2020.

Randy then talked about news specific to Pickering Nuclear:

- Units 1, 4, 5, 6, and 8 are all operating at full power. Unit 7 is coming to the end of its planned outage.

- Overall, the station is running well. There was, however, a forced outage of Unit 1, related to two computers, one standby and one in service. The standby computer had a problem followed by a problem in the in-service computer. The latter triggered an automatic shutdown of the reactor. Unit 1 is now 95 percent returned to full power.

- A site re-set had to take place because an employee assigned to perform a task began to work on the wrong device. This incident occurred because the employee did not follow error-prevention procedure. The management team called a unit meeting to

address the incident and emphasize the importance of following that procedure.

- Unit 7 will be re-synchronized to the grid over the coming weekend. Steps in than procedure were completed over the Victoria Day weekend without incident.

- OPG is monitoring high lake levels across the province. These levels, the highest in 100 years, are not expected to peak until some time in June. OPG is making modifications around its stations to protect against flooding. The station design base for flooding is to anticipate the combination of a 100-year high water event with the wind and wave action for a 200-year storm event.

- A Pickering Nuclear pipe was recently exposed on the beach due to water levels and wind and wave action. This pipe fed outflow cooling water to a pond in a fish farm operation that used to operate in Frenchman's Bay. Since the closure of the fish farm, that pipe has been inactive. OPG is in contact with the city and is geared up to remove that section of pipe from the beach after making sure that proper assessments have been made about environmental disturbance and to be in compliance with municipal building regulations.

- Pickering Nuclear is very busy these days with external reviewers. The U.S.-based Nuclear Safety Review Board has been on the site for the past four weeks, and WANO (the World Association of Nuclear Operators) for the last two weeks. Highlights from these reviews will be presented at the next Council meeting.

Randy responded to Council questions:

- *What is the current level of Lake Ontario? How high above normal is it?*
  It is currently at 74.9 metres and expected to peak at 75 to 75.8 metres in June.

- *Why is the level so high this year?*
  (Speaking from memory pursuant to a recent briefing, Robin Manley said that it is due to the amount and rate of snow melt. He noted that there is a joint Canada-U.S. organization that works to balance levels in the Great Lakes by controlling how quickly water moves from lake to lake.)

Topic #3: Community Update

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

- On April 27 over 300 trees were planted as part of Take Pride in Pickering events. Minister of Environment Conservation and Parks Rod Phillips and Mayor Dave Ryan were in attendance.

- On May 5, 350 people attended Steps for Life, walking for families of workplace tragedy. Hosted on site, this year saw the biggest turnout ever. Over $30,000 was raised.

- On behalf of OPG, Randy and Analiese received the City of Pickering Local Business Award on May 13. OPG was recognized for leadership in the community, corporate citizenship, employee volunteerism and environmental partnerships.

- During Emergency Preparedness Week (May 6 to 10), OPG partnered with the Durham Emergency Management Office (DEMO) to host an information booth at Durham Regional Headquarters. Throughout the week, Analiese and other OPG representatives spoke to many residents of Durham Region about how to be prepared for a nuclear emergency.

- Operation Clean Sweep—the program run by young nuclear operatives at the station that assists seniors with yard work so they can stay in their homes—is underway.

Topic #4: Environmental Monitoring Performance (EMP) Report

Raphael McCalla, Director Environmental Operations Support, presented the 2018 results of OPG's Pickering and Darlington Environmental Monitoring Programs (Appendix 1).

In summary:

- Annual public doses resulting from PN and DN operations are 2.1 µSv (microsieverts) and 0.8 µSv respectively; i.e., 0.2% and 0.1% of the annual regulatory limit

- Station radiological emissions remained at very small fractions of their respective Derived Release Limits (DRL's)

- Dose calculations and annual report were reviewed and verified by an independent third party

- 2018 EMP report was submitted to CNSC on April 25, 2019 and will be available on www.opg.com in June 2019

Raphael responded to Council questions:

- *I note that, over the last 10 years, the Pickering Station public dose is sometimes just below and sometimes just above 0.1% of the legal limit. Why are there differences from year to year?*
  The station is performing better than ever. Reactors running almost all of the time in recent years creates more emissions. In 2018, these emissions represented only 0.15% of background radiation.

- *You mentioned that OPG is performing lake water temperature monitoring to understand potential impacts from the Pickering and Darlington stations. At what depth do the monitors operate?*
  They sit on the surface. They show no indication of a warming trend from the discharge of warm water from the stations that would impact spawning success and larvae development of fish species.

- *What is the difference between impingement and entrainment?*
  Impingement occurs when fish are drawn against the plants' intake screen. Entrainment refers to eggs and larvae passing through the intake screen. The Fisheries Act requires OPG to offset all fish impacted by the intake of station cooling water.

- *Overall, how are Pickering and Darlington doing in comparison with the nuclear power industry as a whole?*
  Our emissions are the lowest of the CANDU fleet.

- *Your last slide ("Looking Ahead") talks about a supplementary study to collect effluent samples for analysis of aluminum to clarify the risks to ecological receptors in Lake Ontario. Does this initiative have any implications for the Pickering site?*
  It all has to do with the Darlington site. Much of the new monitoring work that we undertake is to make sure that all avenues are covered. You tend to get this type of initiative when you are getting close to a licence renewal.

- *I appreciate the slide comparing examples of radiation doses from common activities (chest x-rays, cross-Canada flights, etc.) with the typical dose from a nuclear power plant. But it would be reassuring to see what's normal.* [John, this from Peter O. Not sure what he's getting at. Donna seems to be making a similar point.]

Topic #5: A Perspective on Small Modular Reactors

Council guest Peter Ottensmeyer is Professor Emeritus in the Department of Medical Biophysics at the University of Toronto. He talked about the industrial history of Pickering and its potential future with fast-spectrum SMR's (small modular reactors) (Appendix 2). He explained how SMR's could eliminate used CANDU fuel "waste."

Peter talked about the implications of Pickering Nuclear's close of commercial operations in 2024: loss of jobs, loss of revenue and loss of CO2 avoidance. He described how SMR's could come to the rescue and detailed the opportunity of a fast-spectrum reactor (FSR) recycling facility on the Pickering site. The facility would draw on used CANDU fuel now in storage at Pickering and elsewhere. Such recycling would be a route to the elimination of long-term radiotoxicity.

OPG representatives and Council members expressed appreciation for Peter's review of the SMR potential and the opportunity it offers for the Pickering site.

Topic #6: Update on New Nuclear Development

Robin Manley, Vice President, New Nuclear Development, presented an update on NND (Appendix 3), the mandate of which includes two parallel paths:

- Maintain the option for the Darlington New Nuclear Project (DNNP)
- Pursue small modular reactors (SMR's) as part of OPG's portfolio

Robin noted that in 2012 the CNSC granted OPG a 10-year site preparation licence for new nuclear build at Darlington. In 2013 the province deferred the DNNP due to lower than expected electricity demand but requested OPG to maintain the licence. Since then, OPG has been maintaining licence commitments, including environmental monitoring and site improvements. It is OPG’s intention to seek an extension of the current licence to prepare a site to keep it current for an additional ten years. This will require an updated Environmental Risk Assessment.

Robin then talked about the global interest in SMR's and Canada's SMR roadmap. A collaborative report on the roadmap developed by the nuclear industry and government representatives was released in November 2018. Canada is a Tier 1 nuclear capability country, uniquely positioned to lead the world on SMR's. There is an opportunity to embed SMR development and construction in this country, which means good jobs here. As the largest nuclear operator in Canada, OPG is well placed to develop and export SMR's.

Robin talked about OPG's engagement with a Global First Power proposal for an SMR commercial demonstration unit at Canadian Nuclear Laboratories at Chalk River (CNL). In order to proceed, the Chalk River site would have to accept the proposal, and the project is going through those stages with CNL. Furthermore, the project would need licence approval from the Regulator through its normal public process. He also mentioned OPG activities around potential opportunities in the North, including opportunities in heavy industry, remote communities and mining companies.

Robin responded to Council questions:

- *You indicated that OPG plans to seek renewal of its Darlington new nuclear licence in 2022. How long can OPG keep renewing the licence?*
  The licence is essentially valid forever, though OPG does have to regularly update the environmental and risk assessment of the project.

- *I note that St. Mary's Cement is next door to the Darlington new nuclear site. Has OPG discussed the project with them?*
  Yes, we maintain contact with St. Mary's Cement.

- *Regarding SMR's, is all the fuel uranium based?*

Essentially, yes.

- *Are the small nuclear reactors in U.S. submarines or aircraft considered SMR's?*
  The small reactors used by the U.S. navy are based on a pretty simple design; none look like small modular reactors.

- *Is anyone in the Canadian nuclear industry using natural uranium as fuel?*
  To my knowledge, no one in Canada is using natural uranium; everyone uses enriched uranium. However, New Brunswick Power, which has one reactor, has partnered with a potential user of natural uranium. OPG is maintaining an interest in this project. The issue is economies of scale.

- *What happens to SMR's at the end of their life? Are OPG and other players looking at the whole life cycle?*
  Yes, we look at the big picture. We don't have all the answers yet, but life cycle is part of the question. (Peter Ottensmeyer noted that, currently, only 0.75 percent of the fuel is used by nuclear reactors. The rest is stored as “waste.”)

- *The use of SMR's is a possible solution to the problem of greenhouse gas emissions. Will this potential be used in marketing the technology?*
  I think we will try to do exactly that. The potential for reducing the use of fossil fuels has got to be part of our communications. The challenge is to make the point that renewables cannot, by themselves, supply the amount of non-emitting energy needed to replace fossil fuels.

- *We still spend $54 billion annually to import fossil fuel for cars.*
  An electricity strategy for passenger vehicles and transport is part of the overall strategy we are working on.

Topic #7: Dominique Minière

At the end of the meeting, Dominique Minière expressed his interest in seeing how effective a community advisory council can be in making sure that a plant retains good contact with the local community. He was very pleased with the lively exchange of views that took place at the meeting.

Dominique noted that—with the increase in demand for electricity worldwide as carbon-based systems come off line to be replaced by other systems such as hydro, wind and solar power as well as other more novel experimental natural processes—there will still be a large demand that only nuclear has the capability to deliver without increasing the carbon footprint. He sees major opportunities for additional nuclear deployment in the world to meet these needs and notes that there will continue to be a role for natural gas plants to operate in a reserve capacity when solar (night) and wind (calm) systems are not able to deliver. He remarked that the world is going to need more electricity. In his view, there is a strong case for nuclear power and he sees the SMR opportunity as a critical part of that future strategy.

Topic #8: CAC Plant Visit

It was noted that the Council has not toured the Pickering plant for some time. For members who are available and would like a tour, it was agreed that we should aim for a plant visit at the September meeting. The visitors would probably be asked to arrive at 4:30 pm so that the tour would not encroach too much on regular meeting time.

Topic #9: CNSC News

For selected news items from the CNSC, please see Appendix 4.

Next Meeting
Tuesday, June 18, 2019
Pickering Nuclear Information Centre
(supper available at 5:30 pm)