

DNGS Community Advisory Council
Darlington Nuclear Information Centre
Tuesday, June 27, 2023
Highlights

Ontario Tech University

Jennifer Freeman and Francis Arnaldo spoke about Ontario Tech University and its proposal to add a *subcritical assembly* to its nuclear facilities. This is a type of reactor that is much smaller than power reactors and is designed for research, testing, training and teaching. The university plans for the reactor to be licensed and in operation by 2025 or 2026. Council members were excited to learn about the university and its plans.

Site Update

Richard Geofroy presented a site update. Units 2 and 4 are operating at full power, and Units 1 and 3 are in refurbishment. Unit 3 is expected to be back on line this summer. Among the additional items mentioned: a recent visit from the Prime Minister of Poland; OPG's application to construct a small modular reactor; and the extension of operations at Pickering Units 5 – 8.

Darlington Refurbishment

Pejman Asgaripour presented an overview and update on the Darlington Refurbishment project. He noted that the lessons learned about the refurbishment were cumulatively applied as the project moved from unit to unit. The overall program remains on plan for completion by the end of 2026. It has restored the public's confidence that OPG can complete projects on time and on budget.

Community Affairs Update

Lindsay Hamilton presented an update on recent and forthcoming OPG activities in the community. Among the additional items mentioned: the many public and stakeholder site visits so far this year; involvement of school children in the Bring Back the Salmon program; and the Tuesdays on the Trail summer program.

**DNGS Community Advisory Council
Darlington Nuclear Information Centre
Tuesday, June 27, 2023**

DNGS CAC:

Jim Boate
Cara Gregory
Sheila Hall
Pat Pingle
Heather Reid
Penny Smith
Stacy Wanamaker

Regrets:

Jim Cryderman
Sami Elhajjeh
Bethany Matovic
Mary Novak
Jennifer O'Meara

Ontario Tech University

Francis Arnaldo
Jennifer Freeman

OPG:

Pejman Asgaripour
Richard Geofroy
Lindsay Hamilton

Hardy Stevenson and Associates:

Francis Gillis
Dave Hardy

Topic #1: Health and Safety Moment

Following a Land Acknowledge, Lindsay Hamilton talked about health and safety. She noted that, during the hot days of summer, it's important to wear sunscreen, drink lots of water and seek shade when necessary. Use air conditioning, especially if there's a haze from wildfires.

During the summer, especially before long weekends, OPG will be issuing water safety messages.

Topic #2: Review of Minutes

The Community Advisory Council minutes of April 25, 2023 were approved without changes.

Topic #3: Ontario Tech University

Following an Ontario Tech land acknowledgment, Jennifer Freeman, Executive Director Research Services, and Francis Arnaldo, Biosafety and Radiation Safety Officer, spoke about enhancing hi-tech nuclear facilities at the university (Appendix 1).

Ontario Tech University is the brand name of the University of Ontario Institute of Technology, located in Oshawa. The university provides students a foundation in technology, the sciences and professional practice. Jennifer noted that Ontario Tech University's Department of Energy and Nuclear Engineering is the only undergraduate nuclear engineering program in Canada.

To enhance its hi-tech nuclear facilities, the university is proposing the addition of a subcritical assembly, a type of subcritical reactor that is much smaller than power reactors. (During normal reactor operations, criticality occurs when nuclear fuel sustains a fission chain reaction; such a chain reaction cannot be sustained in a subcritical reactor.) The primary purpose of a subcritical assembly is research, testing, training and teaching. It will play an important role in producing career-ready graduates for the nuclear industry. As well, it will support research for the nuclear industry as it delivers next generation solutions to global challenges.

Francis explained that a subcritical assembly is based on a very simple design:

- No meaningful power can be generated in a subcritical assembly; as a result, there is little to no fuel burnup.
- No measurable heat or pressure is generated; it does not need cooling systems.
- A self-sustaining fission chain reaction cannot occur in a subcritical assembly; as a result, emergency shutdown systems are not required.
- An external radioactive source is required for a subcritical assembly to work; when the radioactive source is removed from the unit, the fission chain reaction stops naturally; criticality is impossible.
- Can turn off the system like a light switch controlling a bulb.

Francis also talked about the elements and staffing of the university's nuclear facility complex, which is specifically designed to allow the safe and secure use of nuclear substances and radioactive devices for research and teaching.

Jennifer noted that there are many steps ahead as the university prepares to apply to the Canadian Nuclear Safety Commission for a licence for the subcritical assembly. There will be a lot of scrutiny from the CNSC, she said.

Francis remarked that a subcritical assembly will allow for a lot more hands-on experience than would be possible with an in-power reactor.

More information on the subcritical assembly project is available at:
<https://ontariotechu.ca/subcritical>

Jennifer and Francis responded to Council questions:

- *You talked about a Slowpoke reactor. What is that?*
Francis: It means a reactor that is just for research purposes; it does not generate a lot of power. There are two Slowpoke reactors in Canada.
Jennifer: There will be only one subcritical assembly (reactor) in Canada.

Dave asked if the university would like the CAC to be involved in its pursuit of a licence for the subcritical assembly. Jennifer said, yes, a letter from the CAC would be helpful. She added that there will be an opportunity for her and Francis to come back to the Council to provide a progress report on this project.

Lindsay expressed interest in inviting the university to exhibit at a Darlington open house.

Additional CAC questions:

- *Will the subcritical assembly be in your Nuclear Facility Complex?*
Jennifer: Yes. No new building will be required.
- *Is the university in the Energy Park area?*
Jennifer: Yes. There is lots of cooperation with OPG and with Durham College.
- *What is the timeframe for licensing and for operation?*
Francis: The timeframe is fluid. We hope to get a licence by the end of this year and be in operation by 2025. But operation may not begin until 2026.
- *Do you need separate licences for construction and operation?*
Francis: No, just one licence for both. The simple design of a subcritical assembly does not include all the extra systems that a power reactor would have, so the regulatory process is much simpler.
- *What is the scope of the research using the subcritical assembly?*
Francis: It's focused on what can be learned from the operation of the unit and how that can be applied to nuclear generation. Side benefits, such as isotope production, may be considered at a later date.

- *Does your Department of Energy and Nuclear Engineering offer a course in SMRs?*

Jennifer: Yes, the SMR is part of the study course.

- *Do you expect increasing enrolment in the Department of Energy and Nuclear Engineering over the coming years?*

Enrolment in the department is already increasing significantly. We make it very clear how student training and research are relevant not only to the nuclear industry but to the energy industry as a whole.

Dave remarked that the CAC would certainly want Jennifer and Francis to come back with a progress report in the future.

Topic #4: Site Update

Senior Vice President Richard Geofroy presented a site update:

- Units 2 and 4 are operating at full power. Units 1 and 3 are in refurbishment outages, with Unit 3 expected to be back on line before the end of July. On Tuesday, August 8 there will be a community celebration at Darlington of the refurbishment project to date. (An invitation to attend the celebration was sent to CAC members on June 14.)
- Unit 4 is the last unit at Darlington remaining to be refurbished.
- On Friday, June 2, OPG hosted the Prime Minister of Poland, Premier Ford and two of his ministers at Darlington. This was an opportunity for OPG to show the Prime Minister nuclear operations at Darlington and share its experience in constructing nuclear plants. The occasion built on OPG's relationship with Poland as that country works to achieve its energy and climate change goals.
- Regarding the Darlington New Nuclear Project, OPG submitted an application last year for a Licence to Construct a small modular reactor (SMR). OPG expects to receive this licence in 2025. OPG recently held workshops to educate and engage the public and stakeholders on the project.
- Regarding Pickering Nuclear, on June 16 OPG submitted a Licence Amendment Application to the CNSC to extend operation of PNGS Units 5 – 8 to the end of 2026. Darlington reactors will not be able to fully meet electricity demand in the summer of 2026. Pickering Units 1 and 4 will be shut down at the end of 2024 as originally planned.

Richard responded to Council comments and questions:

- *Regarding the visit of the Prime Minister of Poland that you mentioned, it is nice to see OPG being able to introduce clean energy options to countries that currently rely on carbon emitting technologies to provide electricity. There are communities in Africa, for example, that rely on diesel fuel generators on ships docked in the harbour.*

Northern communities in Canada similarly rely on diesel fuel. There are lots of opportunities here and abroad for SMR applications.

- *Is there a business case for keeping Pickering Nuclear open?*

Yes, there is a business case as well as a safety case for keeping Pickering Units 5 – 8 open. We will submit our report to the shareholder (Government of Ontario) in August or September. Once we get shareholder support, we will apply to the CNSC to amend our licence to operate to the end of 2026. Ultimately, the only way for the province to achieve net-zero carbon emissions by 2050 is to refurbish Pickering Units 5 – 8.

Topic #5: OPG Outreach to the Community

CAC Facilitator Dave Hardy noted three items in recent correspondence with the Council:

- A New York Times opinion piece describing nuclear waste as “a safe byproduct of carbon-free power”
- Darlington New Nuclear Project workshops for government and non-government stakeholders held in June
- An invitation to a Celebration of Refurbishment of be held at Darlington on Tuesday, August 8, 11:00 a.m. to 1:00 p.m.

Lindsay said she would provide Council members with information about the shuttle bus from the Darlington Energy Complex to the Refurbishment Project Office. Premier Ford and the Minister of Economic Development will be there.

Topic #6: Darlington Refurbishment

Pejman Asgaripour, Project Director, Balance of Plant Nuclear Refurbishment, presented an overview and update on the project (Appendix 2).

Pejman talked about the investment in the project and the resulting major employment and economic benefits to the province.

He reviewed the refurbishment outage schedule:

Unit 2: Q4 2016 – Q2 2020; refurbishment complete; operating at full power

Unit 3: Q3 2020 – Q3 2023; construction complete; return-to-service preparation in progress

Unit 1: Q1 2022 – Q1 2025; in progress; reactor reassembly in progress

Unit 4: Q3 2023 – Q3 2026; currently operating at full power

Pejman talked about unique features of Unit 2 (reconnected to the grid on June 4, 2020) and provided a status update on Units 3, 1 and 4. Unit 3, which is expected to be returned to service this summer, is ahead of schedule. Pejman noted that the lessons learned were cumulatively applied as the project moved from unit to unit. Lessons learned and future opportunities identified from Units 2, 3 and 1 are now being incorporated into Unit 4 planning.

Pejman noted that the safety performance of the refurbishment project continues to exceed the construction industry in Ontario. The overall program remains on plan for completion by the end of 2026. It has restored the public's confidence that OPG can complete projects on time and on budget.

He also noted that Darlington refurbishment is one of OPG's key climate change initiatives.

Pejman responded to a Council question:

- *You talked about a coming increase in electricity demand in the province. I'm assuming electric cars will be part of that.*
Yes, electric cars will be a significant part of the demand.
- *In 10 to 15 years, as much as 90 percent of cars could be electric. The province will need to ramp up the provision of chargers. Chargers for drivers living in apartment houses will be a particular challenge.*

Dave asked Pejman to pass on the CAC's wish for continued success to the staff team at the refurbishment office.

Topic #7: Community Affairs Update

Lindsay Hamilton, Senior Manager Corporate Relations and Projects, presented an update on recent and forthcoming OPG activities in the community:

- The Darlington Nuclear Stakeholder Relations team has led 38 tours (of the site and reactor mock-up) and visits so far this year. A CAC station tour will take place in September or November.
- The latest issue of the Neighbours Newsletter was delivered recently.

- As part of the Bring Back the Salmon program, a group of very rambunctious elementary school students released salmon fry into Bowmanville Creek this year.
- Tuesdays on the Trail 2023: Pickering and Darlington Nuclear Corporate Relations welcomes families to attend a two-hour program on select Tuesdays in July and August at Centennial Park (Pickering) in the morning and the Darlington Waterfront Trail (the Darlington Lower Soccer Fields) in the afternoon. Weekly registration will be offered through www.opg.com.

Lindsay presented a new seven-minute documentary film showing how OPG is working to electrify life. The film has been released as part of Vision 2045, a global campaign that aims to inspire action toward a more sustainable world. Ctrl+Click: [Watch the video](#).

CAC members enjoyed the film. In response to a Council question, Lindsay said it is available at opg.com as well as on Youtube.

Topic #8: Closing Comments

Richard and Dave expressed appreciation to the CAC for their participation in the Council and wished all a great summer.

Next Meeting

Darlington Nuclear Information Centre
Tuesday, September 26, 2023
4 pm to 7 pm