Darlington New Nuclear Public Information Sessions Questions & Answers

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Licensing and Regulatory Affairs

What licence did you get in January 2024?

A: The purpose of the January hearing was for the Commission to establish whether the existing environmental assessment (EA) remained applicable to the reactor technology selected for this project and that the conclusions of the previously approved EA remain unchanged.

In April 2024, the Canadian Nuclear Safety Commission (CNSC) announced its decision that the existing EA for the Darlington New Nuclear Project (DNNP) is applicable to the reactor technology selected by Ontario Power Generation (OPG) - the General Electric Hitachi BWRX-300 reactor.

While this was not a licensing hearing, it was a prerequisite for us to move forward with a Licence to Construct hearing. The Joint Review Panel also recommended this subject matter be determined before moving ahead with the next phase of licensing.

When will you know if you can build the other three units?

A: While the scope of our current Licence to Construct application covers the supporting buildings and systems for all four units, we would need to submit a licence amendment request in order to construct Small Modular Reactor (SMR) Units 2-4.

This would be a separate, subsequent process that would likely involve a review of the amendment application request and possibly a hearing on that subject. That process would be determined by the CNSC.

Why SMRs?

What would you say are the main benefits of this or other SMR technologies?

A: An important benefit specific to this particular reactor design is the strong safety case which includes passive safety features.

As the name implies, this technology is smaller, and a smaller footprint means more can fit in a given space which is a benefit for owners with limited available land. SMRs also typically have lower front-end costs and shorter and more efficient construction schedules.

As we've seen on other fleet projects, we recognize there will be lessons learned from one unit to the next and we expect to improve and become more efficient on each subsequent unit.

We have realized some direct benefits associated with being a first mover on SMRs including from an intellectual property standpoint and from a supply chain perspective. We have the ability to influence a larger percentage of the supply chain being sourced within the province and country.

Because they're scalable, SMRs certainly help to manage size and demand requirements, but fundamentally they are just a class of nuclear reactor, so there are many different types, including those that are being developed across Canada.

Cost and Schedule

What is your timeline for shovels in the ground if you get this licence?

A: We already have a lot of work going on under our Site Preparation Licence, but the prerequisite for nuclear construction to begin is a Licence to Construct.

Following the Licence to Construct approval, which we expect to receive in 2025, we would start construction by excavating for the reactor building followed by construction of the reactor building itself, later next year. In parallel with that work, we would start construction of a turbine building and all auxiliary buildings required to support the facility.

Pending regulatory approvals, nuclear construction will start in 2025 and continue through until the end of 2028, at which point we would turn the facility over to our operations organization. Should the Commission then grant us a Licence to Operate, we would load fuel and start commissioning of the unit in 2029, with the final declaration of commercial operations by the end of 2029.

Will you finish the first SMR completely, fuel and commission it before you begin the next unit?

A: We will finish construction on the first unit before we begin on the second, with the exception of site preparation activities (e.g. grading, common intake structure, etc.). We need certainty that we were successful on Unit 1 and allow enough time to implement lessons learned for the subsequent units. Based on what we've seen on other fleet projects like the Darlington Refurbishment Project, we expect to see a 30 per cent improvement in efficiency on the second unit.

Will these reactors bring down the cost of electricity on my electricity bill?

A: In the current phase of the project, we are developing the detailed cost estimates, as well as the cost of electricity generated by this project. Once this assessment is complete, we will share the release quality estimate for the project.

As we are developing the project, we compare ourselves with other clean energy producers and we have high confidence that the total or levelized cost of electricity resulting from this project will be very competitive with other sources of clean energy.

New Nuclear Growth

Is Ontario the only place looking at building SMRs in Canada?

A: Lots of Canadian jurisdictions are currently looking at SMRs, including New Brunswick, Alberta and Saskatchewan. We've heard from the Yukon and various territories and remote communities asking how nuclear can help with clean electricity.

Some of the available advanced reactor technologies produce higher temperatures of water and steam than traditional styles of reactors, which allows them to potentially be used for industrial integration.

We do expect to see additional SMR projects in Ontario and beyond, whether that's supporting the grid or in industrial or remote communities. We see opportunities for nuclear to participate in all of those important ways.

One of the big things driving what the electricity system needs is the Independent Electricity System Operator's (IESO) Pathways to Decarbonization report, which the Ontario government responded to in the Powering Ontario's Growth report.

A resulting action the government elected to take was to ask the IESO, OPG and Bruce Power to work together on a new *Nuclear Feasibility Study* that looks at how we would achieve a nuclear build-out in Ontario to support the grid. Being the diverse province that Ontario is, reactors of different sizes will be required to meet our province's unique needs.

Are there any SMRs operating in the world today?

A: There are two operating SMRs in the world today; one is floating in Russia, and one is operating in China. SMRs are being used on aircraft carriers and submarines.

We look to these examples for operating experience in construction and operation to ensure we take from and apply their lessons learned on our own project.

In addition, we have access to over 50 years' worth of safe, reliable operating experience from boiling water reactors (BWR) around the world as the design and plans for the BWRX-300 are refined.

How will we reach the province's 2050 decarbonization goals when electricity demand continues to grow?

A: We are looking at a combination of growth opportunities. Of course we're talking about SMRs, but we're also discussing large generation opportunities. We will need to use all the tools and technologies at our collective disposal to meet our generation goals.

Reactor Technology

Are boiling water reactors as safe as CANDUs?

A: Both technologies are very safe. Both fundamental technologies have been in operation for decades in reactors around the world.

Regardless of the technology, any nuclear reactor that is to be built in Canada is subject to the same regulatory requirements and standards imposed by the nuclear regulator, the CNSC.

Our existing CANDU units continue to meet or exceed the requirements imposed by the CNSC, and up to this stage in the licensing process for the BWRX-300, we've been able to demonstrate that it too meets or exceeds the regulatory standards and requirements.

Is the BWRX-300 designed to a Canadian Standards Association (CSA) standard?

A: By and large, this technology uses Canadian standards, but we meet 100 per cent of Canadian regulations.

More specifically, regardless of what you're building or where, the design must meet the regulatory requirements of the host country. These regulations are intended to be technology neutral, but there are exceptions - not to the regulations, but to the standards required to achieve the regulation.

Canada has been a world leader in nuclear for decades, so our regulator the CNSC has a tremendous amount of experience regulating nuclear reactors and are considered internationally as industry experts. They are tough and smart and hold us accountable to ensure we deliver a very safe reactor that meets all Canadian regulations.

The BWRX-300 is American and Japanese – why haven't we invented a Canadian version?

A: After a bit of a quiet period, CANDU is making a comeback with their MONARK design. These are large scale reactors and will be strong contenders for Bruce Power's planned expansion. As Canadians, we want to see their success.

That said, currently, there is not a Canadian-made SMR technology option available.

SMR Fuel

Where are you sourcing the SMR fuel?

A: Canadian uranium will be processed and sent to Urenco in the US or Orano in France for enrichment, before travelling to Global Nuclear Fuel (GNF) (GE Hitachi's fuel division) in North Carolina to be assembled into bundles and finally sent to OPG. There are currently no uranium enrichment facilities located in Canada.

We've signed these contracts to ensure we have a reliable fuel supply for our first unit.

Supply Chain

How can construction companies or people offering specialized construction services get on the OPG vendor list? Are there opportunities on the project for smaller partners/suppliers?

A: Yes, the project has different specialized needs, so we are very interested in expanding OPG's supplier list. Supply Chain has links on the opg.com website for potential suppliers to express initial interest by submitting a request to be evaluated by OPG through the Supplier Self Request Form. Suppliers must meet OPG's supplier requirements and provide requested information about their company to give us a clear understanding of the nature and scope of the goods and services being sold.

In addition, we are working with several construction companies on the DNNP, and potential suppliers also have the option to work through these project partners. For example, our construction partner Aecon will need help with their on-site work program, and I would encourage potential vendors to reach out to them directly.

How do you see this project impacting the Canadian nuclear supply chain?

A: The energy crisis in Eastern Europe has resulted in many countries watching our efforts and progress on this project to determine whether it is the answer to the energy

needs in their own jurisdictions. We have seen a great deal of interest from others who are likely to deploy the same or similar technology.

In fact, because of Ontario's reputation as a leader in nuclear with a strong and established supply chain, we're seeing some countries ordering long lead items years before they're required, understanding there will be significant demand and likely backlog once the project and technology is proven.

By us going first, we're opening the door to Ontario's supply chain first. Countries and jurisdictions that follow our lead in SMR deployment will want to use companies that have a track record, so our use of Ontario and Canadian content will put the spotlight on what our province and country's supply chain has to offer.

Project Resources

What/how many jobs do you expect will be created by this new station once it is in operation?

A: Once we're in a four-unit project, meaning multiple units being built in parallel, we expect to generate about 2000 jobs directly involved with construction of the station.

While we're still assessing the back end of the project, once we move into the operational phase on a four-unit scale, we expect to maintain about 600 jobs in operations, engineering and maintenance - roles that will be directly supporting the plant – in addition to a number of jobs in supply chain supporting our plant operations and maintenance.

Roles required during the operations phase of the project will begin to be posted in 2025 to ensure the team is built and trained ahead of our 2029 in service date.

In addition, many jobs will be indirectly created across the supply chain through those organizations and companies that will be supplying our parts and products for the project.

When will construction trades jobs be posted?

A: There are currently 150 trades workers on site, and that number will be ramping up to 1000. During the four-unit construction phase, there will be approximately 2200 trades and support staff on site.

We've worked with our union partners to assess what trades will be required for each stage of the project, the majority of which will be required once we receive a Licence to Construct.

How will the Pickering refurbishment announcement impact the timeline or workforce for this project?

A: We've completed a holistic assessment of the company's competing projects and we are confident the DNNP timeline will not be impacted by Pickering's refurbishment.

We're doing a very comprehensive workflow analysis on the resource needs for not just these two projects, but also for all the work we need to do across OPG.

Due to the different timelines and differences in the type of work for the new nuclear build and the refurbishment, we have good confidence that we will be able to satisfy the needs of both projects in the timeline that we committed.

Where are nuclear engineering graduates getting jobs?

A: Ontario Tech University's nuclear engineering program is a major pipeline for our engineer new grad program, but there is demand for nuclear engineering graduates across the country, including at Bruce Power, New Brunswick Power, engineering services companies, and in organizations associated with the nuclear supply chain, to name a few.

How can we apply to jobs on the project? Do we have to go through the trades unions?

A: OPG's hiring is done through opg.com/jobs. Whether it's this project or others that OPG is working on, we need people power to make them a success. We'll be posting opportunities as they arise and interested applicants are encouraged to set up a profile or check the site regularly for postings.

OPG Recruitment is also active on LinkedIn, posting job opportunities as they arise, so applicants are encouraged to 'like' OPG on LinkedIn and visit that page for more job-related information.

In addition, our project partners require resources, so applicants are encouraged to look into roles at Atkins Realis, GE Hitachi and Aecon. Some of our trades partners do hire from union halls directly, so that membership process would need to be followed in order to be hired through that route.

The project also impacts the broader supply chain, so those vendor companies will be looking for people as well and can be approached directly.

Public and Stakeholder Engagement

I live close to the power plant; how can I stay up to date on the construction work?

A: There are several ways you can stay informed. We publish a quarterly Neighbours newsletter which is mailed to the doorsteps of 250,000 local homes and businesses around our two nuclear generating stations. The newsletter regularly features project updates, including ongoing work and next steps, as well as a project timeline.

In addition, we have several programs that offer presentations to local community groups, members of the public and those who are interested in learning more about the project, the sign-up for which can be found on our website.

We have a project website that includes documentation from the beginning of the project up to present day, as well as information on next steps and ways for the public to get involved.

There are several ways that community members can get in touch with our staff, including our toll-free information line and the Contact Us section of our project website opg.com/newnuclear.

Both the Darlington and Pickering Nuclear Public Information Centres are also open Monday to Friday for the public to visit, peruse the informative displays and talk to our staff about the project.

Miscellaneous

Can the grid handle additional capacity? Is there a plan to upgrade it?

A: There is grid capacity for the 1,200 megawatts we plan to generate through the DNNP, so we'll connect to the existing network close to the Darlington site. There will not be a need for any major upgrades to the grid to support this project.

This is a large construction project; who has oversight for safety when it comes to the project from workers, public, etc.

A: Ultimately, OPG is the licence holder and is accountable for worker and public safety.

We have a strong health and safety oversight accountability model that includes our shareholder through to our Board of Directors and down to company management and the workers themselves. We've demonstrated the effectiveness of this oversight model in our existing operations and also on major projects and deconstruction projects including Darlington refurbishment and the Lower Mattagami hydroelectric project.

If the government changes, what happens to this project?

A: I don't believe the plan would be altered with a change of government; it's a very well developed and demonstrated plan. We're focused on helping meet the province's demand for electricity, and as several studies, including the IESO's Pathways to Decarbonization have identified, nuclear must and will play a key role in meeting that need and achieving our province's climate change goals, along with other clean electricity generators in Ontario.

What are some of the challenges working on a project of this magnitude?

A: We are utilizing robust project management practises to ensure ours is a success story. We aim to stick to the basics of project management, taking a measured approach to risk mitigation.

We are also building and utilizing a robust lessons learned program. We know from Darlington's refurbishment that a lot is learned on the first unit, so we'll plan for that in the schedule, then each subsequent unit should improve significantly.

Regulatory uncertainty is a challenge on this project because of the new reactor design. We're working in stages; we won't move ahead with nuclear construction until we have regulatory certainty on the reactor design. We don't want any surprises once we're too far down the road with 2000 staff on site.

Will the percentage of power from nuclear energy increase with the SMR coming online, despite Pickering coming offline?

A: Currently nuclear provides about 60 per cent of the province's electricity.

We are nearing the end of the Darlington refurbishment project, which will be completed in 2026. The government announced earlier this year that four of Pickering's units will be refurbished. So, there will be a total of eight refurbished units between Darlington and Pickering.

Two Pickering units will be coming offline next year, and the fleet of four SMRs will roughly offset that amount in terms of energy generation.

There is also interest by OPG and Bruce Power, as well as the Ontario government to increase generation.

Are you planning to build more gas generation?

A: The Pathways to Decarbonization report outlines the different sources of power required to achieve the province's climate goals, and while nuclear is expected to play a significant role, we believe it will take 'all the tools in the toolbox', meaning gas generation will have a part to play.

Nuclear takes some time to assess and build, so expanding our natural gas production will help bridge the generation gap on an interim basis.

Do you see nuclear fusion advancing to a viable place 40-50 years from now?

A: That seems like a reasonable timeframe. As a company committed to innovation, we always have to be looking at what's next. OPG recently signed a Memorandum of Understanding (MOU) with Stellarex Inc. – a Princeton University fusion energy spinout – to explore the development and deployment of fusion energy in Ontario. Through this MOU, OPG and Stellarex will explore establishing a centre of excellence for fusion energy in Ontario and will work together to identify potential future siting and deployment of a stellarator fusion energy device in the province.

What percentage of the world's isotopes does OPG generate?

A: It depends on the isotope, but for example, over 50 per cent of the world's Cobalt 60 supply comes from Ontario's CANDU reactors.

Nuclear isotopes, harvested directly from OPG's CANDU reactors, are used to sterilize medical devices and play an important role in medical imaging and diagnostic procedures, medicine and new drug development. From cancer to Alzheimer's to brain disease, medical isotopes are a game changer and OPG and its subsidiary, Laurentis Energy Partners, are leading the way for the world.

Beyond medicine, stable and radioactive isotopes are also helping to aid in neutron research, border security, food preservation, quantum computing, and so much more.

Acronym List

- BWR- Boiling Water Reactors
- CNSC- Canadian Nuclear Safety Commission
- CSA- Canadian Standards Association
- DNNP- Darlington New Nuclear Project
- EA- Environmental Assessment
- GNF- Global Nuclear Fuel
- IESO- Independent Electricity System Operator
- MOU- Memorandum of Understanding
- OPG- Ontario Power Generation
- SMR- Small Modular Reactor