

Darlington New Nuclear Project

Project Overview and EIS Review

Pickering CAC

June 20, 2023

BIG
things
start
small.



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Agenda

- Project overview and update
- Review of the Plant Parameter Envelope
- Review of the Environmental Impact Statement



Territory Acknowledgement





Darlington New Nuclear Project

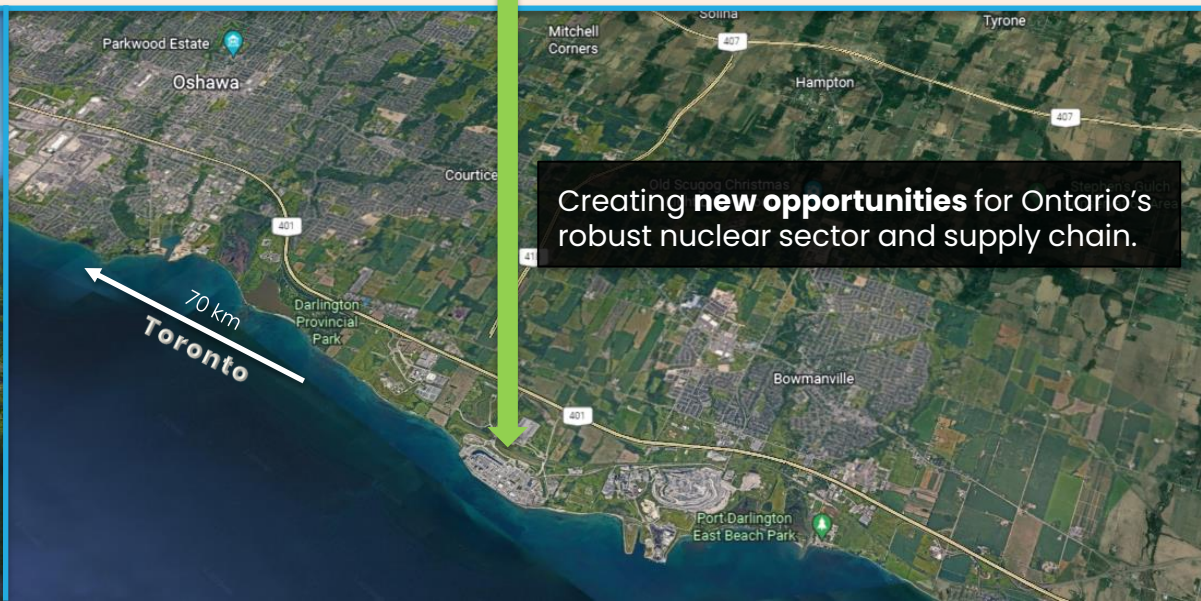
GE Hitachi: BWRX-300

Darlington New Nuclear Project Site
to the East of the Darlington Station



Darlington Nuclear is the only site in Canada **licensed** for new nuclear build with an **accepted environmental assessment**.

Darlington Site
1 Holt Rd South, Bowmanville ON Canada



Creating **new opportunities** for Ontario's robust nuclear sector and supply chain.



Darlington New Nuclear Project Site

DNNP Site Layout



The BWRX-300 will be in the south-west corner of the DNNP site near the existing Darlington Waste Management Facility.

Technology Overview

GE Hitachi: BWRX-300

Designed for a 60-year operational life

~300 megawatts electrical (MWe)

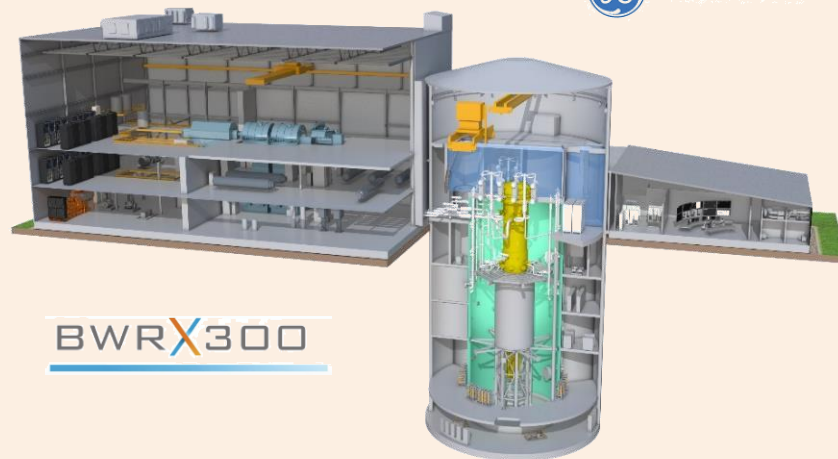
Light water, boiling water reactor using natural circulation

Low enriched uranium fuel with proven design

GEH SMR Technologies Canada is the Canadian division of the world-leading provider of reactor technology and nuclear services.



HITACHI



Canadian Nuclear Facility Licensing



Site preparation



Construction



Operation



Decommissioning



Release
from licensing

**Licence to
Prepare Site –**
Issued and valid
until 2031

**Licence to
Construct –**
Application
submitted on
Oct 31, 2022

**Licence to
Operate**

**Licence to
Decommission**

**Licence to
Abandon**

REGDOC-3.5.1, Licensing Process for Class I Nuclear
Facilities and Uranium Mines and Mills

Darlington New Nuclear Roadmap

BIG things start **small**.



2021

2022

2024

2028





Environmental Assessment

- An **Environmental Impact Statement (EIS)** summarizing results of the EA was submitted by OPG in 2009.
- The EIS was based on a bounding framework which considered various reactor technologies, known as a **Plant Parameter Envelope (PPE)**.
- In May 2012, the Government of Canada accepted the Joint Review Panel (JRP) determination that the DNNP is not likely to result in significant adverse effects and approval of the DNNP proceeding based on the environmental assessment.
- In August 2012, the CNSC issued a Power Reactor Site Preparation Licence.





Environmental Assessment Commitments

- Commitments made by OPG during the EA process were consolidated in the DNNP Commitments Report.
- OPG selected the BWRX-300 SMR in Dec 2021 for deployment at the DNNP site. OPG had committed to complete the following after selection of the reactor technology:
 - An assessment of effects for the BWRX-300 parameters that were not within the PPE.
 - A review of the EIS for the deployment of the BWRX-300 to ensure that the results of the EIS remain valid.





Plant Parameter Envelope Review

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Plant Parameter Envelope

A PPE was developed for the project as a basis for the evaluation of the potential safety and environmental effects of multiple reactor designs being considered.

- A PPE is a listing of values that can be used in the EA and licence applications to assist in predicting the potential safety and environmental effects.
- The PPE concept is accepted by regulatory agencies in Canada and the U.S.A.
- PPE parameters encompass vendor information provided from Pressurized Water Reactors (PWRs) and CANDU Reactors.
- The 2009 EIS was based on 198 design parameters using the limiting value from either the ACR, EC6, EPR or AP-1000.



Review of Plant Parameter Envelope



- The BWRX-300 was compared to the PPE used in the EIS.
- Nine BWRX-300 values were not within the original envelope:
 1. Fire protection, short-term withdrawal rate from water source
 2. Fire Protection, quantity of water stored
 3. Deeper embedment of reactor
 4. Heavier cask to transport used fuel on site
 5. Importance factor for wind load
 6. Lower minimum release height above finished grade
 7. Activity by isotope of airborne releases
 8. Activity by isotope of solid radioactive waste
 9. Activity by isotope in liquid effluent releases
- The EIS review determined the conclusions of the EIS are not impacted and remain valid.



Environmental Impact Statement Review

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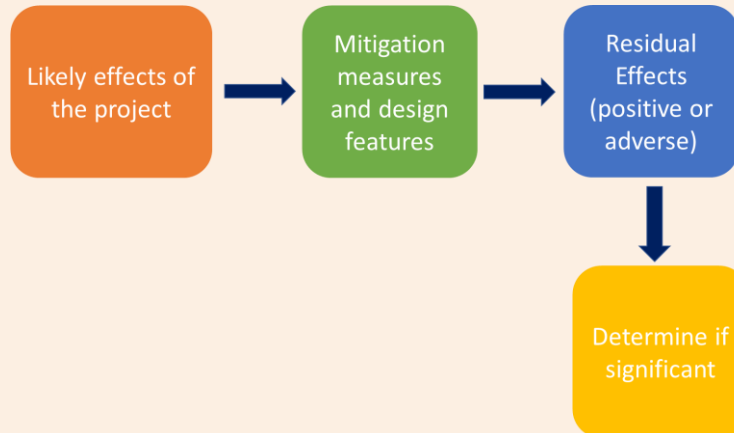
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Environmental Impact Statement Review

The EIS Review Report considers the environmental impact of deploying up to four BWRX-300 SMRs at Darlington site.

- The EIS was submitted 2009; EIS Review is a task to support the LTC application.





EIS Review – Summary of Results

- BWRX-300 deployment has a smaller footprint – smaller in physical size and electrical power.
- Construction requires reduced workforce, on-site traffic, excavation of soil and rock.
 - Lower atmospheric emissions and noise during site preparation and construction.
- Opportunity to retain on-site ponds, wetlands, vegetation habitats, and shoreline habitats.
 - Additional studies done to determine effects from noise, dust, groundwater, and surface water on retained habitats – residual adverse effects expected to be minor.





EIS Review – Summary of Results

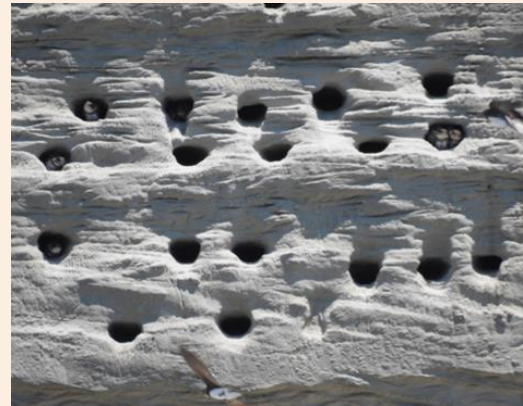


- BWRX-300 deployment utilizes once-through lake water cooling.
 - Cooling tower structures considered as options in the original EIS no longer apply.
 - Adverse effects of cooling towers no longer applicable – potential bird strikes, effects on the visual landscape, and the enjoyment of private property.
 - Cooling water flow rate for the BWRX-300 substantially lower than that assessed in EIS, and will result in lesser effects.
- BWRX-300 will be operated such that no radiological liquid effluent is released during normal operation of the facility.



EIS Review – Summary of Results

- The BWRX-300 will require less marine and shoreline works.
 - Lake infilling not required.
 - Reduced effects for lake water circulation patterns, shoreline processes, and temperature at mouth of Darlington Creek.
 - Shoreline habitat for bank swallows in short term (first reactor) will be retained – residual adverse effects from vibration and changes to groundwater flow anticipated to be minor.
 - Residual adverse effects predicted for aquatic biota during the construction of lake infill and cooling water intake and discharge structures anticipated to be less.







EIS Review – Summary of Results

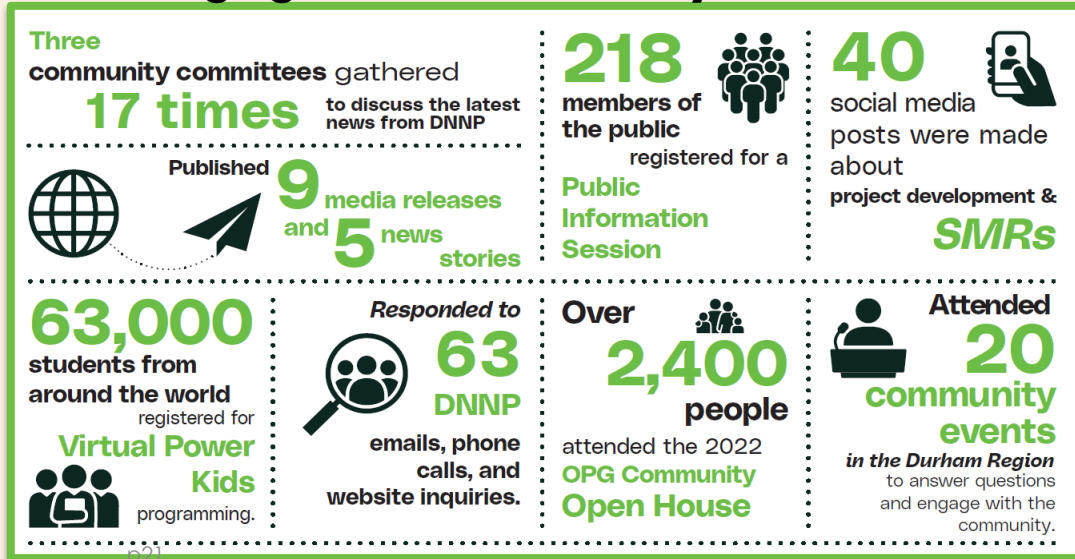


- No permanent effect to groundwater flow – groundwater will be allowed to recharge to natural levels after construction.
- Environmental effects (from accidents, malfunctions and malevolent acts; effects of the environment on the Project: and cumulative effects) expected to be less than those assessed in the EIS.
- EA follow-up and monitoring program remains suitable for BWRX- 300 deployment.
 - Verifies predictions of environmental effects identified in the environmental assessment and determines effectiveness of mitigation measures.

Committed to Community Engagement

Since 2006, OPG has undertaken a comprehensive outreach and communications program including activities designed to reach a broad audience of stakeholders and the public to ensure they are well informed about the DNNP, including the EIS and PPE review.

2022 Engagement Summary:





Thank you