



## **Supplementary Information**

### **Presentation from Ontario Power Generation Inc.**

In the Matter of the

#### **Ontario Power Generation Inc.**

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Application for a licence to construct one BWRX-300 reactor at the Darlington New Nuclear Project Site (DNNP)

#### **Commission Public Hearing Part-2**

**January 8-10 and 13-14, 2025**

## **Renseignements supplémentaires**

### **Présentation d' Ontario Power Generation Inc.**

À l'égard d'

#### **Ontario Power Generation Inc.**

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Demande visant à construire 1 réacteur BWRX-300 sur le site du projet de nouvelle centrale nucléaire de Darlington (PNCND)

#### **Audience publique de la Commission Partie-2**

**8-10 et 13-14 janvier 2025**

**Our power is**   
***changing the world***

## **Opening Remarks**

Nicolle Butcher, President & CEO – Steve Gregoris, Chief Nuclear Officer



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# Darlington New Nuclear Project Licence to Construct Application Hearing Part 2

CMD 24-H3.1D

January 2025



# Presentation Summary



- Application and Timeline Review
- Part 1 Hearing Undertakings
- Project Update
- Design and Safety Features
- Ready for Construction, Preparing for Future Operations
- Other Areas of Interest
- Conclusions

# Through the LTC application, *OPG has demonstrated:*



We have met all **regulatory requirements** for a construction licence.



The BWRX-300 leverages operating experience from generations of previous BWRs, providing **enhanced safety features and a robust design**, demonstrated through a comprehensive safety analysis.



OPG's history of safe operations and project management success **demonstrates our capability** to undertake the construction of a BWRX-300 on the Darlington New Nuclear Site.



**OPG is qualified** to carry on the activities the licence will authorize.

# Darlington New Nuclear Roadmap

**BIG** things start **small**.



2024

2025

2028

2029

2034

2036



\*All dates are estimated based on current project schedules\*

The text 'Project Update' is centered in the lower half of the image. It is written in a large, bold, white, sans-serif font. To the left of the text is a green arrow pointing to the right. The background of the slide is a photograph of two large yellow mining trucks on a dirt road at dusk or dawn. The truck on the right has the number '90' on its side. The sky is a mix of blue and grey, and there are some trees and structures in the background. On the right side of the slide, there is a decorative graphic consisting of several overlapping triangles in shades of green and blue.

# Commission Undertakings from *LTC Hearing Part 1*

- As part of CMD 24-H3-Q, OPG was directed to provide information on seven questions pertaining to the BWRX-300 reactor physics behaviour, modelling and validation of models, and its Distributed Control and Information System.
  - The BWRX-300 is modelled using software that is fully qualified and validated for its application, utilized in previous BWR licensing applications, and further validated for any unique BWRX-300 features.
  - *Detailed responses are included in OPG's CMD 24-H3.1C*
- OPG was also directed to submit its predictive Environmental Risk Assessment (ERA) to the Commission Registry to be included on the record for this hearing.
  - *The predictive ERA is included in OPG's CMD 24-H3.1C*



# Project *Momentum*

- Engineering, procurement and construction of utilities and support buildings across the site to support construction (e.g., water, power, administration and fabrication building)
- Progress on the reactor building shaft, the tunnel boring machine launch shaft and the forebay shoring walls.
- Completed design engineering work to enable start of construction.
- Completed licensing commitments as planned.

**OPG has demonstrated we can execute work safely, with quality and on schedule.**



# Indigenous *Engagement*

**We have continued to engage with the Nations, working towards the goal of a long-standing relationship.**



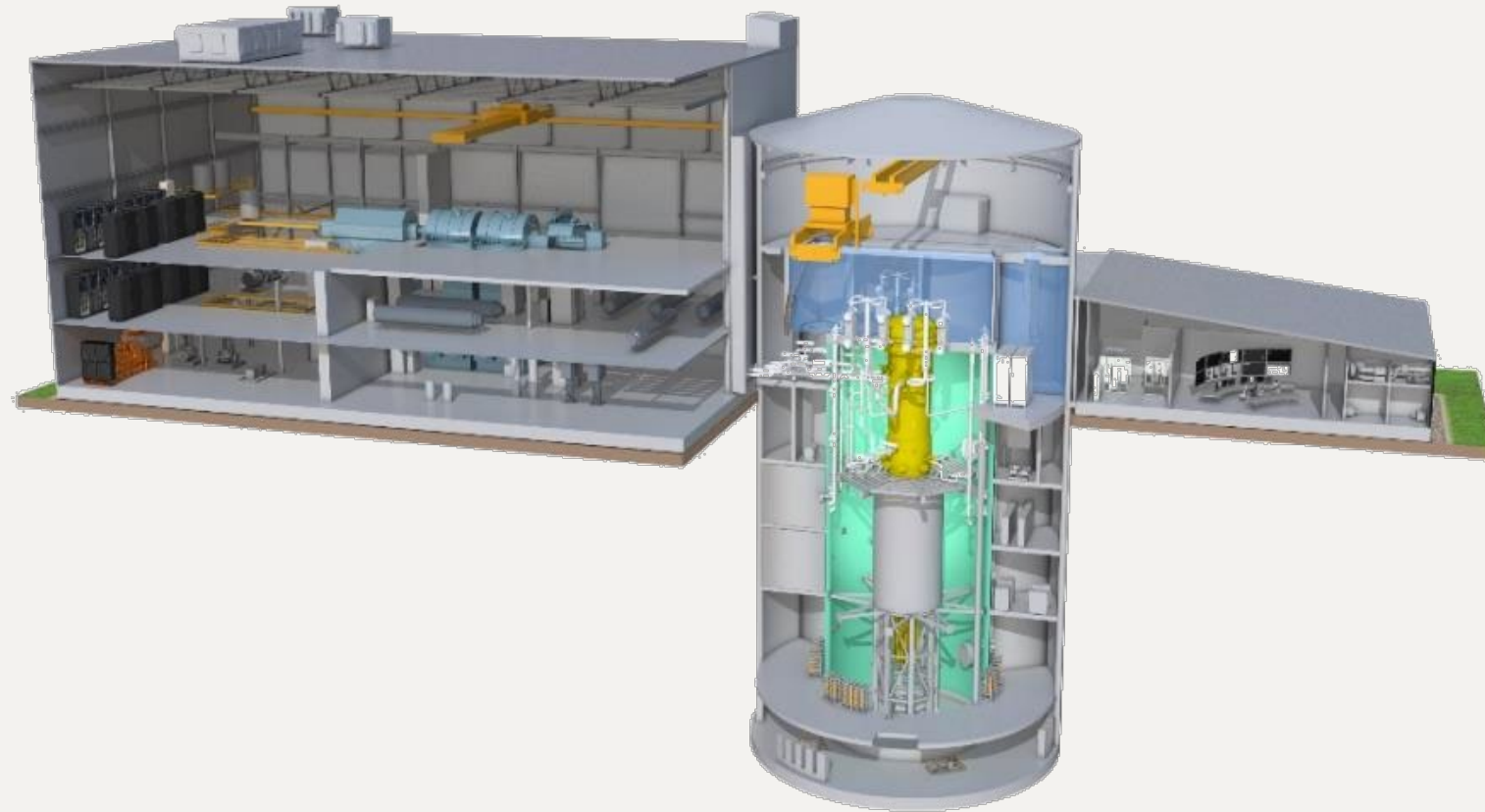
- Continued to progress commercial participation discussions.
- Initiated waste-specific meetings; Terms of Reference under development.
- Achieved approval of 18 permits in 2024.
- Continued process development for aquatic and terrestrial offsetting.
- Distributed letters of intent:
  - Long-term relationship agreement
  - Project agreement for DNNP
- Developed new internal model and escalation process for nuclear.
- Rolled out mandatory Indigenous Relations training across the project.

**We will continue to incorporate the concerns and priorities we've heard from the Michi Saagig Williams Treaties First Nations into our programs:**

- Progress the Indigenous Knowledge Study and a cumulative effects assessment.
- Continue the conversations on project-specific, and long-term plans for waste.
- Ensure nuclear safety remains a priority.
- Develop an environmental monitoring augmentation plan in partnership with WTFN.
- Continue to discuss, and where possible, address, ongoing capacity concerns.
- Progress discussions on restoration planning.
- Incorporate Indigenous Knowledge, wherever possible.

# Next *Steps*





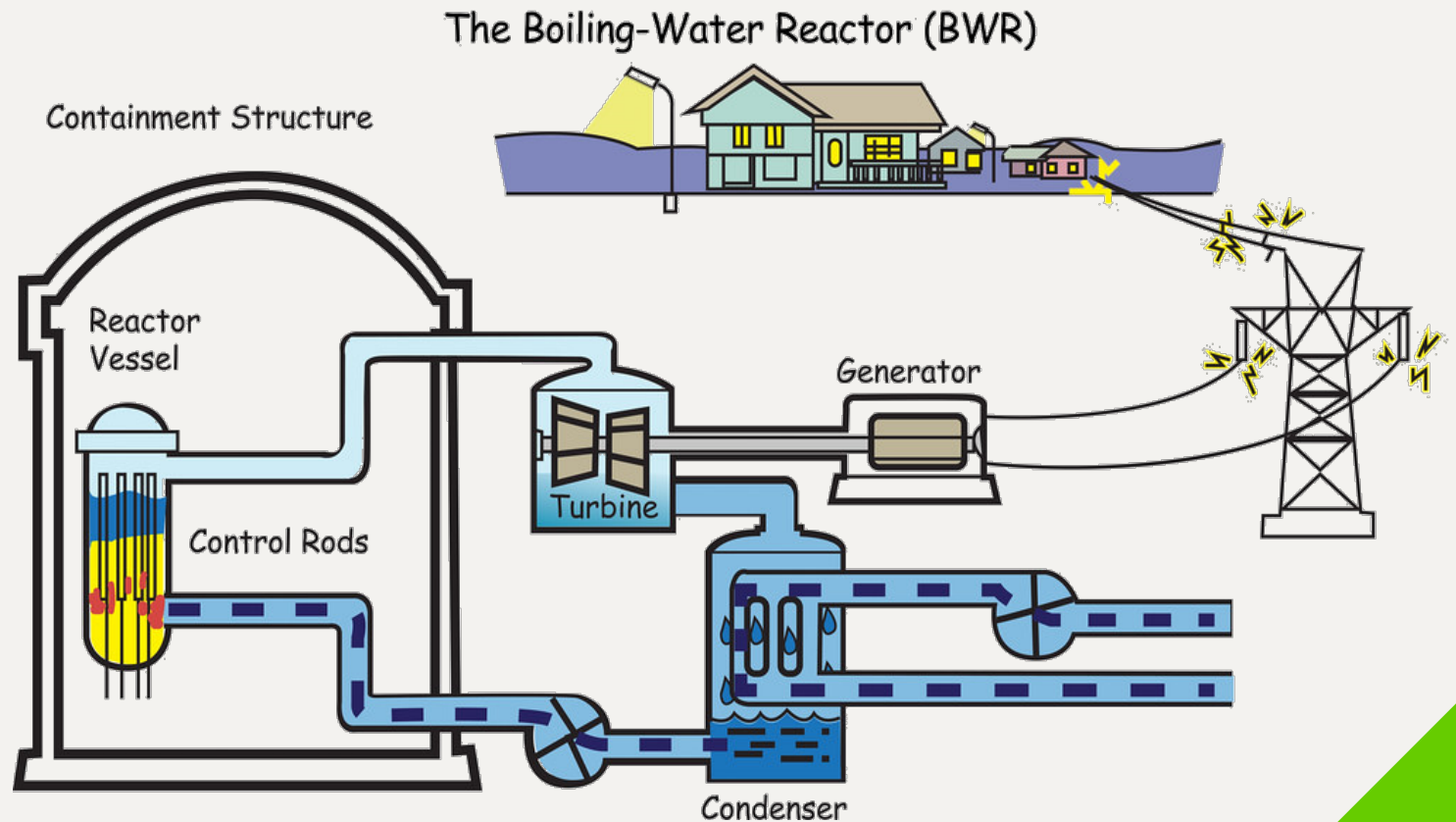
# BWRX-300

Proven Design and Safety Features

# Boiling Water Reactors (BWR)

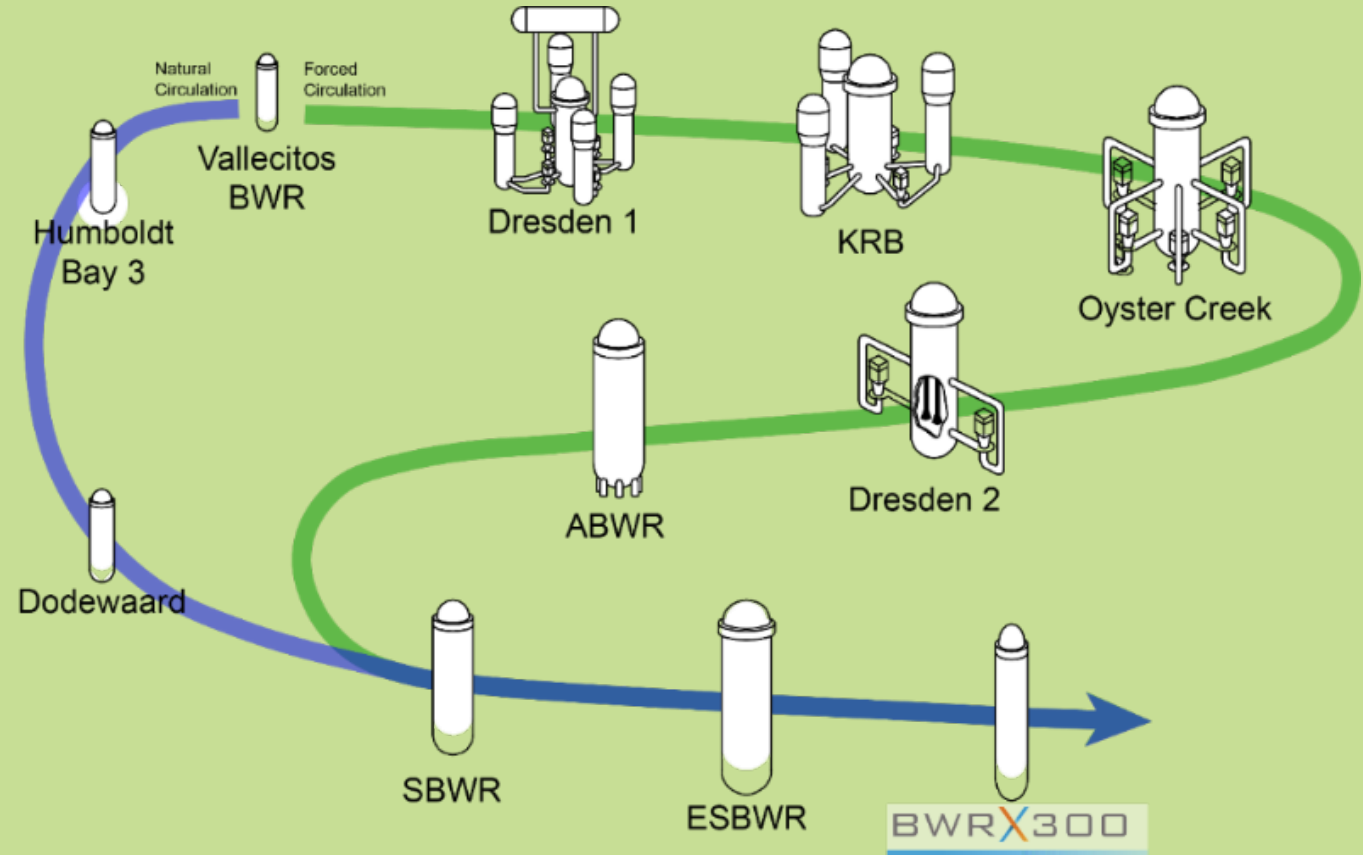
- Low enriched fuel (3-5%)
- Light water coolant moderator
- Natural circulation of coolant
- Direct cycle design with no secondary steam generator and pressurizer
- Traditional 'balance of plant' for electricity generation

## A Simple Way to Make Steam

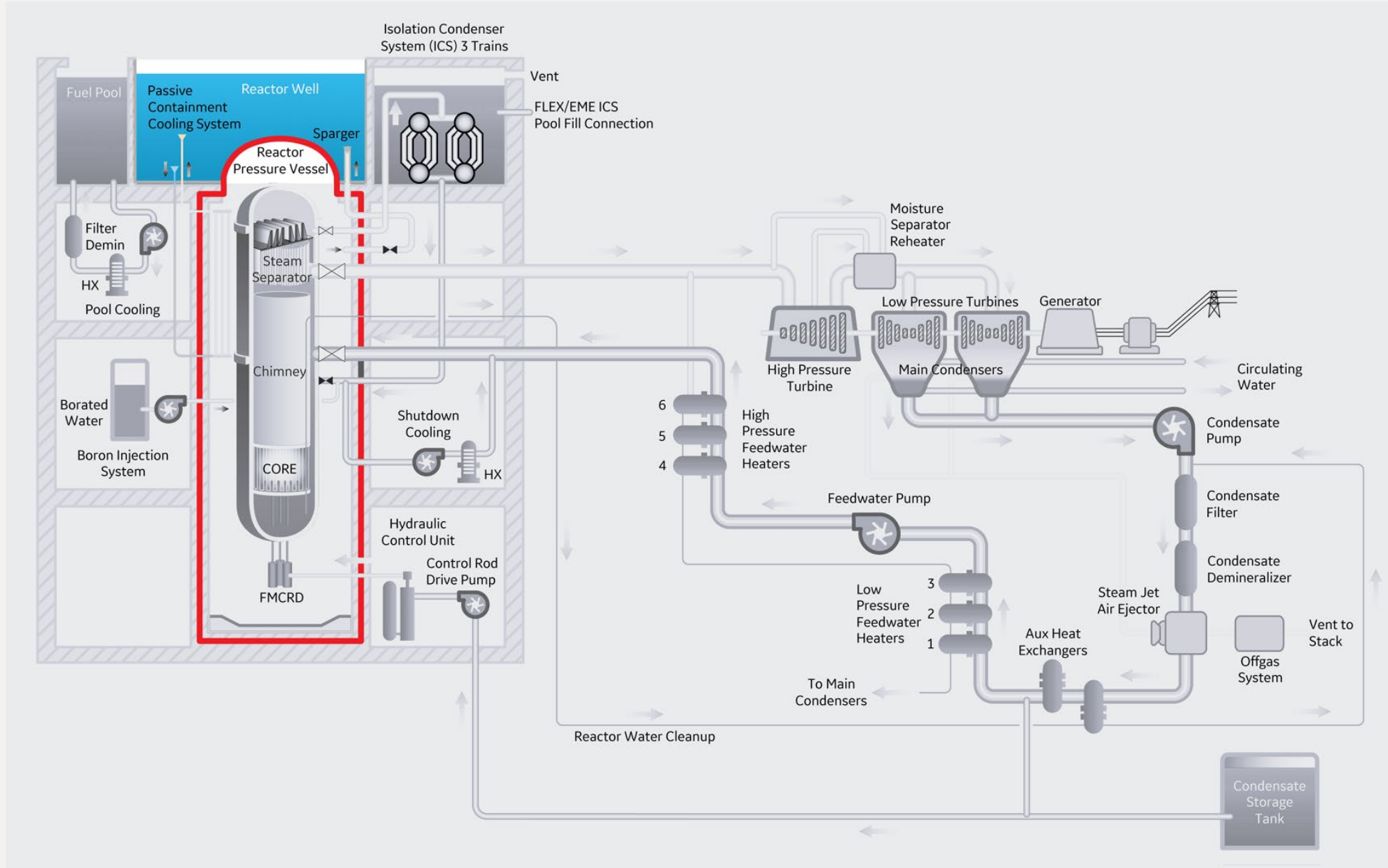


# Simplification *Driving Safety*

- Boiling Water Reactors have been in **operation for decades.**
- Design and safety enhancements over **10 generations.**
- Passive safety systems = inherently **safe and robust design.**



# BWRX-300 Design and Safety Features



# Safety Case of the *BWRX-300*

- Nuclear safety is OPG's **overriding priority**.
- The BWRX-300 is **inherently safe** due to its enhanced design and passive safety features.
- A **comprehensive deterministic and probabilistic safety analysis** confirmed that the design is safe and robust.
  - **All hazards** were considered in the analysis.

**Safety analysis demonstrates the BWRX-300 will be within regulatory safety goals, with significant margin.**

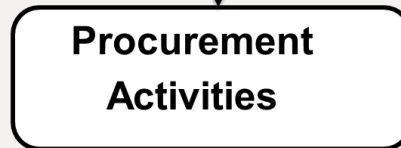
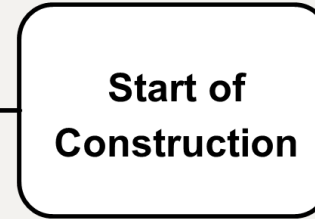
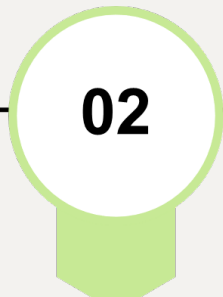


# System/Structures Design *Process*

**Baseline 1**  
Requirements Established

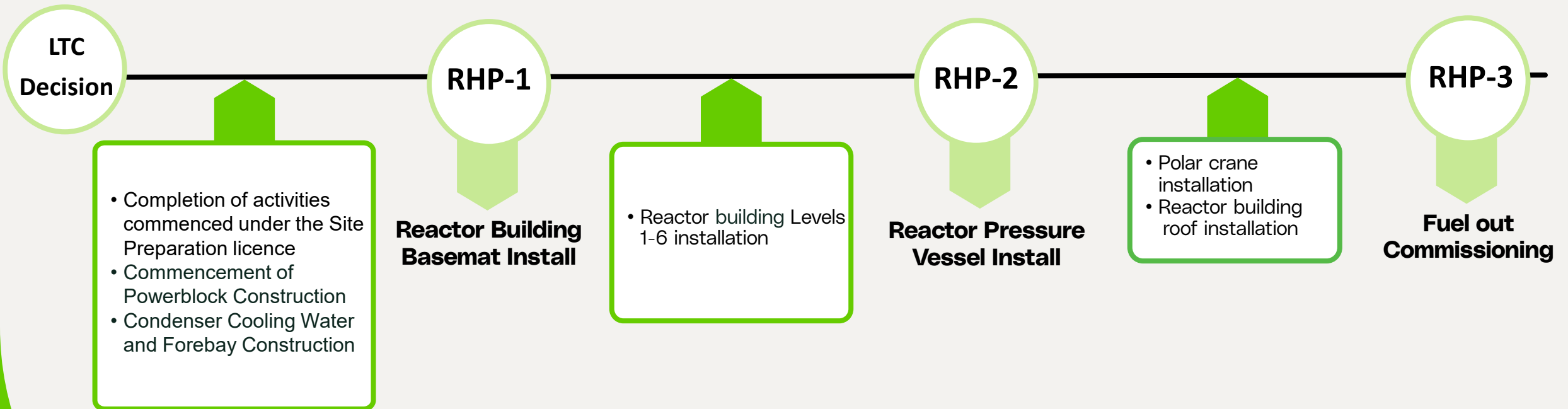
**Baseline 2**  
Standard Bounding Design

**Baseline 3**  
Site-Specific Design



# Regulatory Oversight

## Hold Points





**Ready for Construction**  
**Preparing for Future Operations**



# Training and Qualification for *Construction Activities*

- OPG and vendor partners use qualified, experienced and competent personnel to perform construction phase work.
- Qualification criteria is determined for positions and roles based on the work that will be performed.
- There is an established system for management, tracking, monitoring, and reporting of records.

**Staff supporting Licence to Construct activities are fully qualified through rigorous training programs.**



# Conventional

## *Health and Safety*

- The project is executed in compliance with legislative, regulatory standards & site-specific plans, governed by the Occupational Health and Safety Act.
- OPG and its vendor partners track detailed safety metrics on the project against industry-best targets to manage performance.
- A conventional waste management plan is in place for construction to address the management and mitigation of non-radioactive hazardous materials and waste.

**The DNNP continues to use OPG's rigorous and effective safety management practices to keep safety our top priority.**



# *Training & Qualification for* **Future Operations**

- OPG has extensive experience establishing and conducting training programs.
- OPG will utilize a systematic approach to training that complies with regulatory requirements.
- The training program leverages knowledge and experience from existing BWR programs.
- A full-scope simulator is being designed and incorporated into training timelines.
- Planning activities will ensure full qualification of certified staff for a future Licence to Operate.

**OPG is establishing, and will implement training plans to ensure certified staff are ready for a Licence to Operate.**



# Project *Readiness*

**OPG is ready to execute construction and is prepared for future operations.**

- OPG has established partnerships for experience-sharing with the broader industry.
- International mega project benchmarking and lessons learned are implemented into planning.
- DNNP has leveraged lessons learned from Darlington's successful refurbishment project.
- OPG has utilized independent review boards to assess project readiness and address gaps.
- External resources with key experience are supporting planning, construction and commissioning.





# Other Areas of Interest



# Waste *Management*

- OPG has been safely handling, processing and storing radioactive waste for more than 50 years.
- Waste management for a BWRX-300 is fundamentally no different.
- OPG assessed two options for the interim storage of low and intermediate level waste (L&ILW) as part of the approved EA.
  - **Subject to further regulatory approvals, OPG intends to proceed with interim storage of L&ILW onsite at a licensed facility.**
- Consistent with OPG's other nuclear generating stations, used fuel assemblies would be stored in a fuel pool before being transferred to a dry storage cask. They would remain onsite, on an interim basis, in a licensed Independent Spent Fuel Storage Installation.

**No radioactive waste will be generated during the Construction Licence period.**

# *Preliminary*

## **Decommissioning Plan (PDP)**

- The project site will be restored for industrial use at the end of facility operation.
- Consistent with international practices and leveraging experience from decommissioned reactors, sub-surface structures will be dismantled to a nominal removal depth.
- A Financial Guarantee is in place to ensure funds are available for the future decommissioning.

**The DNNP PDP is based on international BWR/PWR experience and is aligned to CNSC Regulatory Requirements and Guidance.**

# Conclusion



OPG has met all **regulatory requirements** for a construction licence.



The BWRX-300 leverages operating experience from generations of BWRs, providing enhanced and **inherent safety features and a robust design.**



OPG's history of safe operations and project management experience **demonstrates our readiness** to undertake construction of a BWRX-300 at the Darlington New Nuclear Site.



OPG has demonstrated we are **qualified, confident and ready** to carry out the activities the licence will authorize.

# *Electrifying* **life**

**OPG**