

# Ontario Power Generation



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**ONTARIOPOWER**  
GENERATION

# Darlington Refurbishment



- **Darlington Nuclear Station placed in-service in the early 1990's and has provided over 25 years of clean, competitive, reliable power to the citizens of Ontario.**
  - Four Units: 3524 MW net Output
  - 20% of Ontario's Electricity – power for 2 million homes.
- **Recognized internationally for excellent safety, equipment reliability, and operating performance.**
- **Darlington's design requires a mid-life refurbishment to allow for 30 or more years of ongoing operations.**
  - 10 planning, 10 execution
  - \$12.8 Billion investment –
  - 12,800 jobs; \$89.9 Billion boost to Ontario's GDP.

# Darlington Refurbishment Schedule



# Refurbishment Scope and Vendors

Defuel, Fuel Handling, Special



Retube and Feeder Replacement



Turbine / Generator



Steam Generators



Balance of Plant



Cyclic Outage



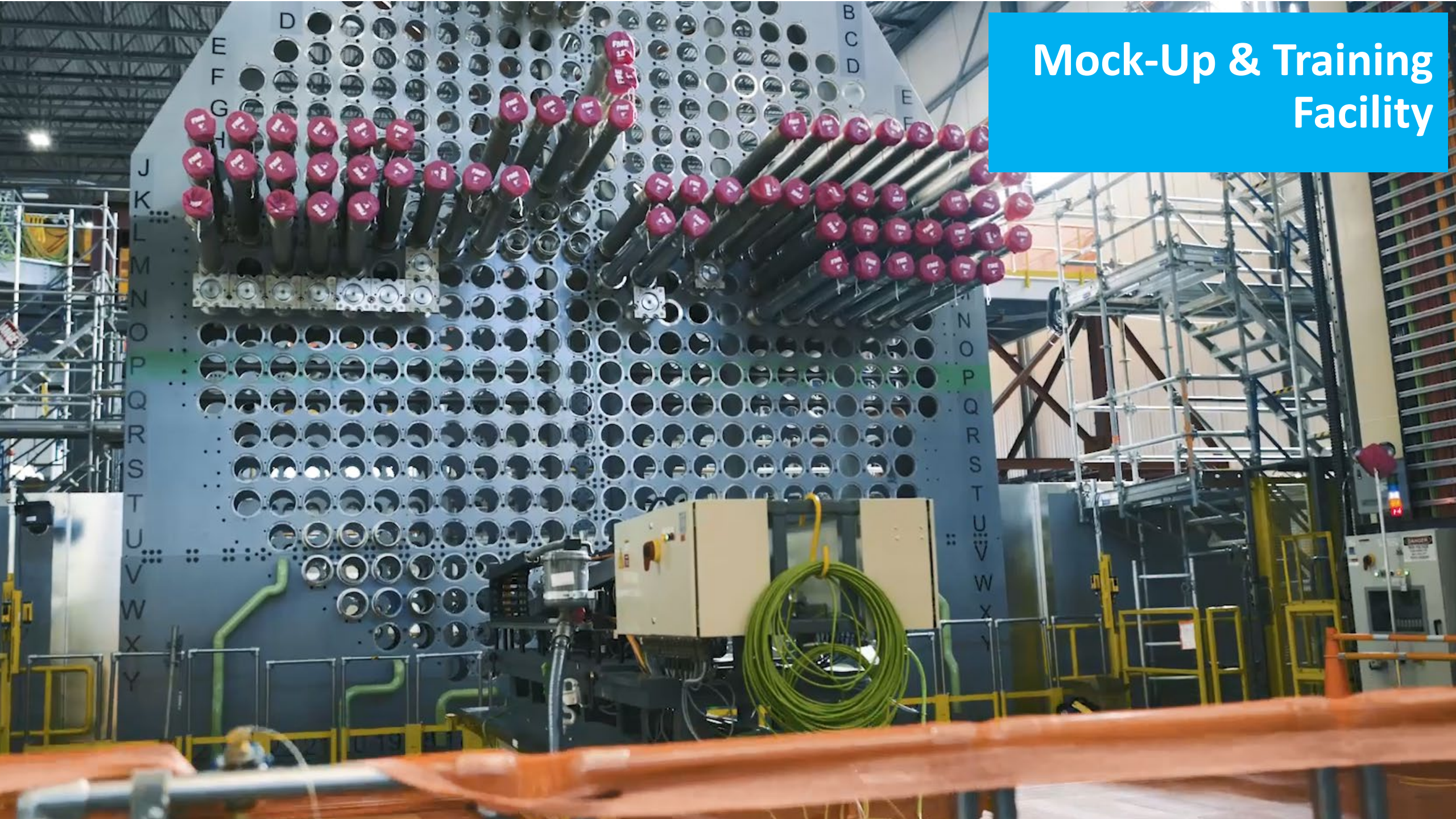
# Unit 2 Complete

At 4:13 a.m. on June 4, 2020, Unit 2 was officially declared available for service, after a three-and-a-half year refurbishment to replace major components and perform a midlife overhaul.

- Project execution work on Unit 2 Refurbishment began in October 2016.
- After successfully defuelling the reactor and islanding it from the operating plant, work got underway to first dismantle, then take on the complex task of reassembling the reactor.
  - Construction work was declared complete in March 2020, allowing restart activities to begin.
- In Sept. 2020, the Darlington Refurbishment Project team was recognized by the Electric Utility Cost Group with its **Best Practice Award** for the project management excellent which facilitated the completion of Unit 2's refurbishment.



# Mock-Up & Training Facility



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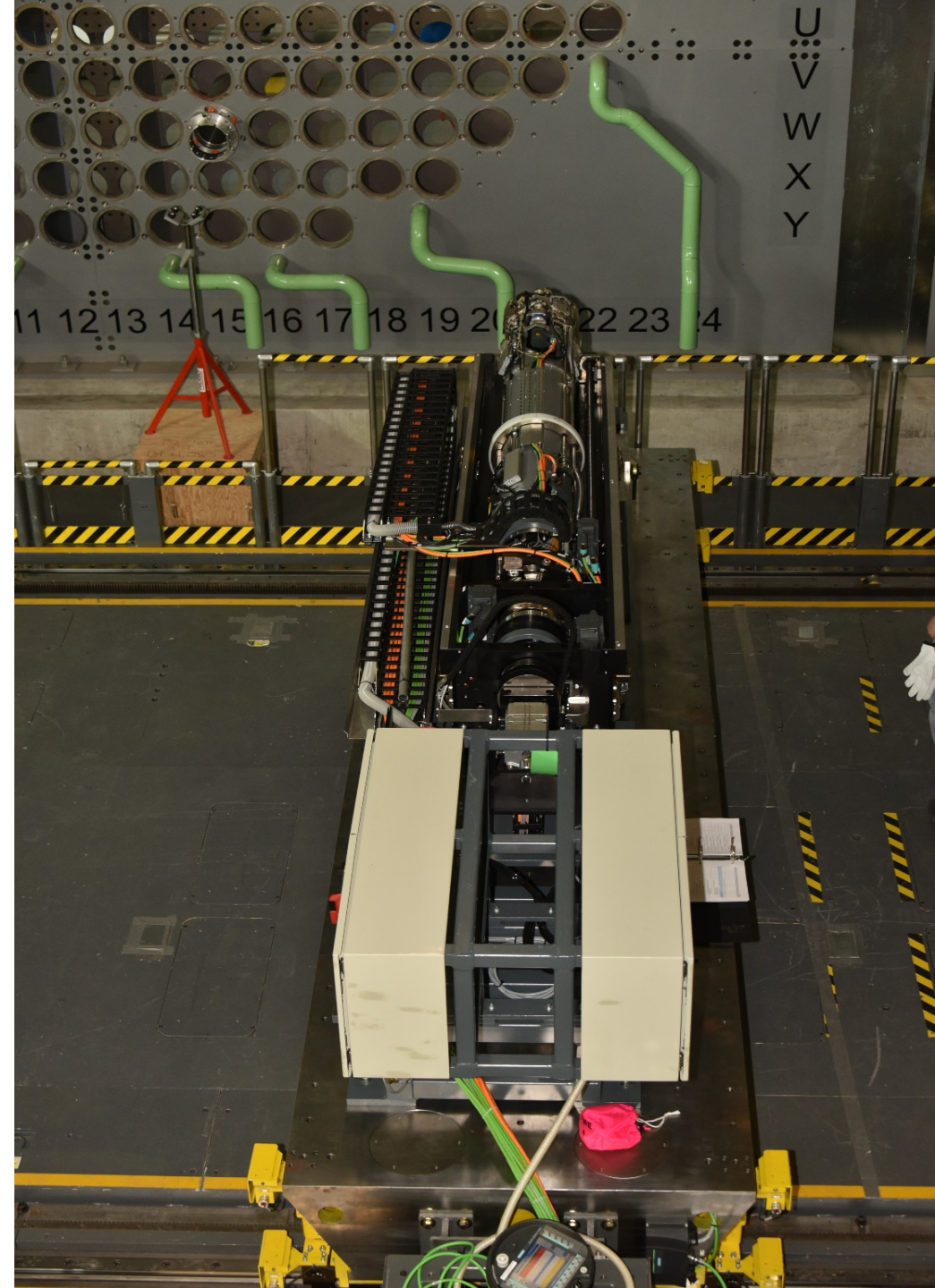
# Unit 2 Lessons Learned

Over 4,000 lessons learned from the knowledge and experience gained on Unit 2 during planning and execution.

Lessons learned built into plans for Unit 3.

## Including:

1. Work stream optimization and organizational alignment
2. Industrial Safety and Radiological Practices
3. Tooling changes/upgrades
4. Critical task training
5. LEAN/Kaizen process improvements
6. OneTeam culture advancements



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# Unit 3 Status Update



**Unit 3 Refurbishment execution activities are progressing ahead of schedule:**

- Unit 3 Refurbishment started September 3, 2020.
- Safety continues to be our top priority - COVID-19 measures are in place to protect staff and workers.
- Completion of engineering design, field execution work plans, and material procurement continue to progress well and remain on track with no threats to execution.
- The project is currently executing the second major work segment (i.e., disassembly) and is progressing well.



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# Units 1 and 4 Status Update

- Work planning, design engineering efforts, procurement and execution of pre-requisite work continues to progress well.
- Planning for Unit 1 and 4 is underway with Unit 1 scheduled to commence its Refurbishment on Feb. 15, 2022.
- Lessons learned, schedule advances and future opportunities from Unit 3 are being incorporated into the subsequent unit planning.



# OneTEAM

- Success reliant on vendor partners and construction trade unions.
- ~ 2,000 trades required to support the remaining Refurbishment activities for Units 3, 1, & 4.



**AECON**

**SNC • LAVALIN**



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# Summary

## **Safety performance continues to exceed the construction industry in Ontario.**

- Project execution continues to progress well with COVID-19 protective measures in place, which have been effective to date.
- The overall program is tracking to the \$12.8 billion budget and mitigating the cost impact of the pandemic.
- Additional opportunities are being identified and incorporated in the plan in order to achieve further schedule gains.
- Darlington Refurbishment is one OPG's key climate change initiatives.
- The refurbishment of the four Darlington units remains on plan for completion by the end of 2026.





# Darlington Refurbishment

## DARLINGTON NUCLEAR REFURBISHMENT PROJECT

30 MORE YEARS OF CLEAN ELECTRICITY  
NUCLEAR ENERGY PLAYS A FUNDAMENTAL ROLE IN ONTARIO'S CLEAN-ENERGY EQUATION

THE REFURBISHED  
DARLINGTON STATION  
WILL REDUCE GREENHOUSE GAS  
EMISSIONS BY AN ESTIMATED

**297**  
MILLION TONNES

THAT'S THE EQUIVALENT  
OF REMOVING

**2** MILLION  
Cars per  
YEAR

FROM ONTARIO'S ROADS



**1 IN 5**

HOMES AND BUSINESSES  
ARE POWERED BY DARLINGTON -  
WITH VIRTUALLY  
**NO GREENHOUSE GASES**



**20%**

OF ONTARIO'S POWER IS  
SUPPLIED BY DARLINGTON -  
ENOUGH TO SERVE A CITY OF  
2 MILLION PEOPLE



**60%**

OF ONTARIO'S DAILY  
ELECTRICITY NEEDS ARE  
SUPPLIED BY THIS PROVINCE'S  
NUCLEAR FLEET



**8¢** kWh

30 YEARS OF POWER  
BELOW AVERAGE COSTS

ONTARIOPOWER  
GENERATION



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# Commitment to the Environment and Community

- Our community programming & partnerships supports environmental education initiatives
- Both Darlington and Pickering recognized for environmental stewardship and sustainable operations:
  - Darlington Nuclear, 2019, Sustainability Award, Oshawa Chamber of Commerce
  - Pickering Nuclear, 2020, Environmental Civic Award, City of Pickering
  - Pickering Nuclear, 2019, Local Business Civic Award, City of Pickering
- Pickering and Darlington “Gold” Wildlife Habitat Council certification for “Certified Wildlife Habitat” and “Corporate Lands for Learning” sites since 1997 & 1999
- Certified under the ISO 14001 standard for Environmental Management System



# Questions?

# ONTARIO **POWER** GENERATION



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