Nuclear Sustainability - Waste Management & Decommissioning Strategies

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A cleaner, more sustainable future.

Ontario is undertaking an energy transformation. One that will help decarbonize the economy and create a brighter future in the province. The foundation of this transformation will be the nuclear industry.

All waste in our care falls under three categories of action.

Preventing

We prevent waste before it is created.

OPG's NS division takes many actions to reduce the amount of total waste we produce.

Within every level of waste we manage we are successfully finding solutions to ensure we prevent waste from being created.

Managing

We manage the waste in our care.

A small percentage of the waste generated by nuclear power must be effectively disposed of for the long term.

This action - Managing Waste - speaks to our long-term stewardship and commitment to safety. While abiding by federal and international regulations we ensure not even an ounce of waste is left unmanaged.

Harnessing

We harness waste and by-products to make nuclear power useful beyond just generation.

Here we find the most innovative and directly beneficial of our actions. The nuclear industry has made massive leaps in creating a more circular economy. Our waste and by-products benefit many industries including: Healthcare, Food, Pharmaceuticals, Computing, and new nuclear.

Nuclear Sustainability Services

Since 1974, caring for the waste from Ontario's 20 CANDU Reactors

Western Waste Management Facility

- WWMF In service 1974
- Licensed to 2027
- L&ILW from all stations
- Bruce Power used fuel

Darlington Waste Management Facility

- DWMF In service 2005
- Licensed to 2033
- Darlington used fuel
- ILW from Refurbishment

Pickering Waste Management Facility

- PWMF In service 1994
- Licensed to 2028
- Pickering used fuel
- ILW from Pickering re-tube

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What We Do

- NSS leverages more than 5 decades of operational experience and expertise to minimize and store nuclear waste and plan for their permanent disposal.

- Only North American utility to handle all levels of waste, and own its own transportation fleet, incinerator & compactor.

Low-Level Waste




Intermediate-Level Waste
Resins, filters, reactor components

Used Fuel
Spent uranium fuel bundles

Sort and Segregate

Recycle and Free Release (Clean)

Process (Reduce Volumes)

Interim Storage


Wet Storage

Dry Storage

Future Disposal
NSDF - OPG

Future Disposal
DGR - NWMO

Future Disposal
DGR - NWMO

OPG

Safety

Nuclear Safety

- Public and employee safety remains OPG's top priority.
- Safety Analysis demonstrates that public and worker dose remains within CNSC regulatory limits during normal operations, and within Safety Report acceptance criteria due to credible accidents and malfunctions.
- OPG's exemplary record of public and employee safety is supported by the Waste Management Facility Safety Report summary, available on Reporting > Regulatory reporting - OPG

Radiation Safety

Radiation Protection has four key objectives:

- Keeping individual doses below regulatory limits.
- Preventing unplanned exposures.
- Maintaining individual risk from lifetime radiation exposure at an acceptable level.
- Ensuring collective doses are As Low As Reasonably Achievable (ALARA).

Nuclear Sustainability Services – Pickering Waste Management Facility (NSS-PWMF)

Operations

- In 2024 Used Fuel from Pickering Nuclear Generating Station (PNGS) continued to be removed from the station and stored safely and on time.
- In 2024, Pickering loaded 80 Dry Storage Containers (DSCs), hitting our 2024 target of 80.
- Current 10-year operating licence to 2028.
- WMF performance reports available on opg.com.

Dry Storage Containers loaded and transferred in 2024

Approved: Loading 6-Year Cooled Fuel into DSCs at NSS-PWMF

- OPG submitted a request to CNSC in June 2023 to amend the Waste Facility Operating Licence (WFOL) at NSS- PWMF to allow for the storage of minimum 6-year cooled fuel to support PNGS Units 5-8 Refurbishment defueling activities.
- PWMF successfully commissioned 2 DSCs with 6-Year Fuel in 2024 to support this initiative.
- CNSC has provided written acceptance allowing OPG to proceed with processing and storing at the PWMF a maximum of 100 DSCs (at a time) containing a minimum of six-year used fuel.

Storage Building 5

- To provide adequate interim storage space for used fuel in Dry Storage Containers (DSC), a new storage building is required to accommodate additional interim storage space.
- This will be the final used fuel building required at Pickering, given the Nuclear Waste Management Organization's (NWMO's) planned used fuel Deep Geological Repository (DGR) in-service date of mid-2040's.

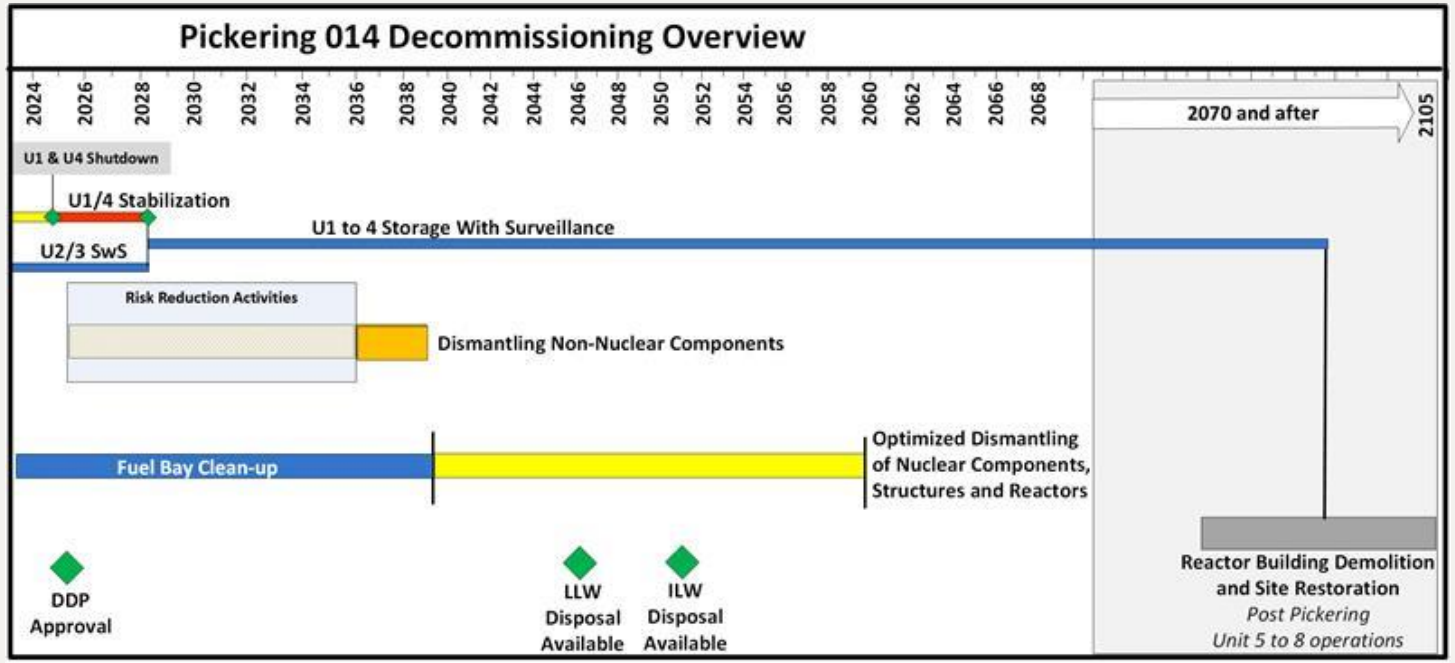
Pickering Component Storage Structure (PCSS)

- To support the refurbishment of Pickering NGS Units 5-8, additional onsite interim storage space for removed L&ILW reactor components is required.
- A Letter of Intent to construct the PCSS was submitted to the CNSC on February 1, 2024.
- Licence amendment submission documents posted to CNSC website
- Intervention deadline May 6; written hearing July 2025

Decommissioning PN Units 1-4

Since 1971, PNGS has played an important role in Ontario's energy mix.

Pickering Units 1-4 Decommissioning Strategy



Stabilization: Once systems are shutdown, they are placed in a safe state until their removal. This involves draining and isolating systems, removing hazardous materials, and implementing enhanced security measures.

Detailed Decommissioning Plan (DDP): Prior to decommissioning, a DDP is developed. It refines and adds detail to the preliminary decommissioning plan. This plan is updated every 5 years at minimum, or as required. The first DDP, submitted to the CNSC in Dec 2024, will be for 2028-2033; and next 2033-2038, etc.

Storage with Surveillance: The long-term control and monitoring of the station before dismantling. Our SWS plan includes rigorous safety protocols, regular inspections, and maintenance activities to ensure the facility remains secure. This phase also gives us time to further plan and prepare for full dismantling. Risk reduction activities are expected to occur during this time to remove any liabilities before full dismantling.

Dismantlement & Site Restoration: Full scale removal and handling of waste from systems, components and structures. There is a mix of conventional/ non-radioactive waste and radioactive waste. Once dismantlement is complete, the site will transition to Site Restoration.

Questions?

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