



**Written submission from
BWXT Nuclear Energy Canada Inc.**

Request for Confidentiality

In the Matter of

BWXT Nuclear Energy Canada Inc.

Revision of Financial Guarantee for BWXT
Nuclear Energy Canada Inc.

Public Hearing - Hearing in writing based on
written submissions

January 2024

**Mémoire de
BWXT Nuclear Energy Canada Inc.**

Demande de confidentialité

À l'égard de

BWXT Nuclear Energy Canada Inc.

Révision à la garantie financière de BWXT
Nuclear Energy Canada Inc.

Audience publique - Audience fondée sur des
mémoires

Janvier 2024



Nuclear Energy Canada Inc.

ADMIN '23NOV14PM12:26

Commission Registry
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa Canada
K1P 5S9

CNSC-CCSN	
7167312	
Doc#	N° de document

Date: November 13, 2023

Subject: Acceptance of Financial Guarantees (Toronto and Peterborough)

Dear Sir/Madam,

BWXT has submitted updated Preliminary Decommissioning Plans (PDPs) and draft financial guarantee instruments for both Toronto and Peterborough facilities to staff [2]. Staff have indicated that they consider the submission acceptable [1]. It is understood that the acceptance of the revised financial guarantees rests with the Commission. Therefore, BWXT hereby requests Commission approval of the revised financial guarantees for the Toronto and Peterborough facilities.

Additionally, BWXT requests that the PDP documents and the draft financial guarantee instruments be held confidential as this information is considered proprietary to BWXT. However, BWXT has prepared public summaries for both Toronto and Peterborough PDPs. These are enclosed and are also available on our public website at the following address:
<https://www.bwxt.com/bwxt-nec/safety/environmental-monitoring>.

Sincerely,

David Snopek
Director, EHS & Regulatory

enclosures

Cc: J. MacQuarrie, T. Richardson (BWXT)
J. Amalraj (CNSC)

REFERENCES

- 1) Letter from J. Amalraj (CNSC) to D. Snopek (BWXT) titled, '*CNSC staff review of BWXT Nuclear Energy Canada Inc.'s (BWXT) submission on August 30, 2023, related to updating its Preliminary Decommissioning Plan for Toronto and Peterborough*', dated October 30, 2023 (e-Doc 7156442)
- 2) Letter from D. Snopek (BWXT) to J. Amalraj (CNSC) titled '*BWXT response to CNSC staff review of BWXT PDP for Toronto and Peterborough*', dated August 30, 2023 (e-Doc 7118342)
- 3) Letter from D. Snopek (BWXT) to J. Amalraj (CNSC) titled '*Updated preliminary decommissioning plans for the BWXT Nuclear Energy Canada Toronto and Peterborough facilities*', dated November 25, 2022 (e-Doc 6936527)



BWXT Nuclear Energy Canada Inc.

Fuel Assembly Operation Preliminary Decommissioning Plan Summary - 2023

BWXT Nuclear Energy Canada Inc.'s (BWXT NEC) fuel assembly operation assembles natural uranium fuel pellets into fuel bundles.

The facility can possess both natural and depleted ceramic uranium dioxide (UO_2) fuel pellets which are used to produce CANDU® (Canadian Deuterium Uranium) reactor fuel bundles.



The Facility

Sintered fuel pellets are received from the BWXT NEC's Toronto facility. The fuel bundle manufacturing operations involve the stacking and loading of these fuel pellets into zirconium tubes, sealing, welding and machining of the tubes to produce fuel elements and the assembly of the fuel elements into fuel bundles. Details of fuel bundle design vary by reactor. However, fuel bundles currently manufactured at BWXT

NEC in Peterborough generally consist of 28 or 37 fuel elements.

The fuel assembly operation is located at 1160 Monaghan Road, Peterborough, Ontario. BWXT NEC fuel assembly operations occur within four buildings on the western side of the plant complex located between Monaghan Road and Park Street North. GE Canada retains ownership of the property and leases the structures to BWXT NEC under a lease agreement.

The main building for the nuclear fuel operations is Building 21, while Building 24 is used for storage. There is also a Fuel Handling and Engineering Solutions business unit operating in Building 26. Building 28 is the main shipping and receiving area.



Preliminary Decommissioning Plan Summary

The Preliminary Decommissioning Plan (PDP) and associated Decommissioning Cost Estimate (DCE) has been produced to determine the amount of the financial guarantee required in accordance with Canadian Nuclear Safety Commission

(CNSC) regulatory documents REGDOC-2.11.2 *Decommissioning* and REGDOC-3.3.1 *Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

Strategy

The preferred decommissioning strategy for the BWXT NEC Fuel Assembly Operation is for decommissioning of all licensed areas to a condition wherein it can be released from regulatory control under a Licence to Abandon issued by the CNSC. This entails the removal of all contaminated equipment for disposal and remediating the site and structures of uranium/beryllium contamination.

Hazards

There are potential radiological exposures associated with the handling of uranium dioxide. An effective radiation protection program is in place at the facility and radiation doses received by persons who work at the facility are a fraction of the applicable dose limit. With the facility shut down, radiation doses would be further reduced and the radiation protection program would be maintained. Therefore, radiation hazards to workers during decommissioning would be similar to, or less than, radiation hazards present during normal operations.

Similarly, environmental releases and public dose during normal operations are both a very small fraction of the licensed release limit and public dose limit respectively. Emissions and public doses will be reduced even further during the decommissioning period.

Similarly, a beryllium safety program is in place for beryllium operations and will continue through decommissioning.

All decommissioning work will be completed with strict adherence to BWXT NEC's

Radiation Protection Manual, Beryllium Safety Manual, and Environmental Health and Safety Manual. Where required, these documents will be used as a benchmark for the design and implementation of decommissioning-specific programs, procedures and plans including:

- Radiation Protection
- Beryllium
- Hazardous Material Handling and Industrial Safety
- Environmental Protection
- Health and Safety
- Utility Management
- Fire Protection and Emergency Response
- Training

Approach

The decommissioning of the site will take place in four phases. These phases include:

- Phase 1: Post Operational Shutdown and Completion of Characterization Survey;
- Phase 2: Completion of a Detailed Decommissioning Plan (DDP) and Submission to CNSC;
- Phase 3: Decommissioning of Property; and
- Phase 4: Completion of Final Surveys, CNSC Sign-Off and Application of Licence to Abandon.

During post-operational shutdown, waste and materials in inventory will be removed and an interior and exterior characterization survey will be completed at the site to determine the level of uranium impacts at the facility. The information collected will be used as input to the DDP.

All uranium area production machinery, together with associated ventilation and filtration equipment would either be disposed of as radioactive waste, decontaminated and disposed of as unrestricted waste or

decontaminated for other use. Building infrastructure in the uranium area (Heating, Ventilation, and Air Conditioning (HVAC), piping and light fixtures) would be removed and cleaned for unrestricted disposal, or disposal as Low Level Waste (LLW). A central washing area will be set up, so that effluent from equipment washing will be treated and any surfaces identified to be contaminated will be decontaminated before disposal. Decommissioning will start with the removal of materials and equipment from the operating floor, and the final work will consist of thorough vacuuming and washing.

Similarly, beryllium area production machinery and associated ventilation equipment would either be disposed of as beryllium-contaminated hazardous waste, decontaminated and disposed of as unrestricted waste, or decontaminated for other use.

The existing Radiation Protection Manual and Beryllium Safety Manual will form the basis for radiation and beryllium protection during decommissioning. All decommissioning work will be completed in strict adherence to BWXT NEC's Radiation Protection Manual and the Beryllium Safety Manual. Where required, further development of plans and protocols in support of radiation protection and personnel dosimetry, to ensure doses are kept as low as reasonably achievable, will be completed. Workers will be monitored for uranium and beryllium uptake, as are current production workers. They will be required to wear personal protective equipment at all times when in the working area. The existing change facilities, worker staircases, and lunch room facilities will be used as for current production workers.

Final End-State Objectives

The end-state objective of the decommissioning strategy is the unrestricted release of the entire licensed property from regulatory control. As such there is no predicted requirement for long-term institutional controls. Costs for refurbishment or demolition of the structures at the conclusion of the decommissioning are outside the scope of the PDP.

Cost Estimate

The cost estimate includes all labour, material, equipment, site operating expenses, CNSC regulatory fees, waste packaging, transportation and disposal costs required to decommission the facility to the end-state objective of unrestricted release for either reuse or demolition.

The total cost for decommissioning the site is estimated to be \$10,069,695 in 2027 Canadian dollars.

BWXT NEC has requested that the financial guarantee instrument be a combination of Surety Bond and Letter of Credit, with the first \$516,904 being satisfied by a letter of credit. The remaining obligation would then be satisfied by surety bond.

Until such time as the updated PDP amounts and financial instruments are approved, BWXT NEC maintains the existing financial guarantees.

Conclusions

BWXT NEC will undertake periodic reviews of the PDP and update it as required. The updates will reflect any changes to operations, conditions, evolving technologies and regulatory requirements.

Unless otherwise dictated by significant changes to the facility, the PDP will be updated every five years.

Contact Us

For further information, please contact:

Phone: 1.855.696.9588

Email: questions@bwxt.com

Web: nec.bwxt.com

BWXT Nuclear Energy Canada Inc.
1160 Monaghan Road
Peterborough, ON K9J 0A8

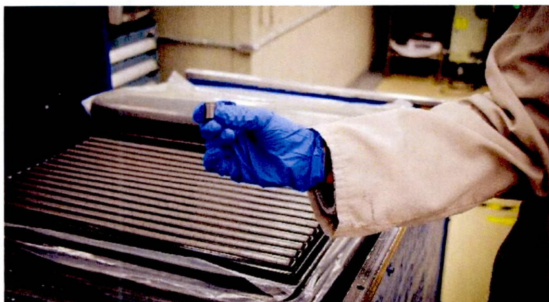


Nuclear Energy Canada Inc.

BWXT Nuclear Energy Canada Inc.

Fuel Pellet Operation Preliminary Decommissioning Plan Summary - 2023

BWXT Nuclear Energy Canada Inc.'s (BWXT NEC) fuel pellet operation processes ceramic grade natural uranium dioxide (UO_2) powder into fuel pellets used primarily in CANDU (Canadian Deuterium Uranium) reactor fuel bundles.



The Facility

Ceramic grade UO_2 powder is received in Type IP-1 steel drums from the Cameco Port Hope Facility or alternate supplier. This powder is pressed into pellet-shape and sintered in hydrogen atmosphere furnaces at high temperature. The sintered pellets are hard and ceramic. Sintered pellets are ground to the required diameter, inspected and wrapped for shipment to BWXT NEC's Peterborough facility. In Peterborough, the pellets are loaded into zirconium sheaths and assembled into bundles.



The fuel pellet operation is located on the east side of Lansdowne Avenue, north of Dupont Street at 1025 Lansdowne Avenue, Toronto, Ontario. BWXT NEC's property comprises a parking lot and two buildings, known as Building 7 and Building 9. General Electric Canada retains ownership and leases the property to BWXT NEC.

Building 7 is municipally addressed as 1025 Lansdowne Avenue, Toronto, Ontario, and houses uranium dioxide pellet manufacturing operations on the first, second, and third floors. The fourth floor contains office space for BWXT NEC personnel. Building 9 is municipally addressed as 155 Brandon Avenue, Toronto, Ontario. It is used to temporarily store uranium wastes. The remaining portion of the property between the two buildings is used as a parking lot. In addition, a liquid Hydrogen storage facility is located outside, to the northeast of Building 7.

Preliminary Decommissioning Plan Summary

The Preliminary Decommissioning Plan (PDP) and associated Decommissioning

Cost Estimate (DCE) has been produced to determine the amount of the financial guarantee required in accordance with Canadian Nuclear Safety Commission (CNSC) regulatory documents REGDOC-2.11.2 *Decommissioning* and REGDOC-3.3.1 *Financial Guarantees for the Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

Strategy

The preferred decommissioning strategy for the BWXT NEC Fuel Pelleting Operation is for decommissioning of all licensed areas to a condition wherein the site can be released from regulatory control under a Licence to Abandon issued by the CNSC. This entails the removal of all contaminated equipment for disposal and remediating the site and structures of uranium contamination.

Hazards

There are potential radiological exposures associated with the handling of uranium dioxide. An effective radiation protection program is in place at the facility and radiation doses received by persons who work at the facility are a fraction of the applicable dose limit. With the facility shut down, radiation doses would be further reduced and the radiation protection program would be maintained. Therefore, radiation hazards to workers during decommissioning would be similar to, or less than, radiation hazards present during normal operations.

Similarly, environmental releases and public dose during normal operations are both a very small fraction of the licensed release limit and public dose limit respectively. Emissions and public doses will be reduced even further during the decommissioning period.

All decommissioning work will be completed with strict adherence to BWXT NEC's Radiation Protection Manual and

Environmental Health and Safety Manual. Where applicable, these documents will be used as a benchmark for the design and implementation of decommissioning-specific programs, procedures and plans including:

- Radiation Protection
- Hazardous Material Handling and Industrial Safety
- Environmental Protection
- Health and Safety
- Utility Management
- Fire Protection and Emergency Response
- Training

Approach

The decommissioning of the site will take place in four phases. These phases include:

- Phase 1: Post Operational Shutdown and Completion of Characterization Survey;
- Phase 2: Completion of a Detailed Decommissioning Plan (DDP) and Submission to CNSC;
- Phase 3: Decommissioning of Property; and
- Phase 4: Completion of Final Surveys, CNSC Sign-Off and Application of Licence to Abandon.

During post-operational shutdown, waste and materials in inventory will be removed and an interior and exterior characterization survey will be completed at the site to determine the level of uranium impacts at the facility. The information collected in the characterization survey will be used as input to the DDP.

All production machinery, together with associated ventilation and filtration equipment would either be disposed of as radioactive waste, decontaminated and disposed of as unrestricted waste or decontaminated for other use. All building infrastructure in the three operating floors

(HVAC, piping and light fixtures) would be removed and cleaned for unrestricted disposal, or disposal as Low Level Waste (LLW).

The existing Radiation Protection Manual will form the basis for radiation protection during decommissioning. All decommissioning work will be completed in strict adherence to BWXT NEC's Radiation Protection Manual. Where required, further development of plans and protocols in support of radiation protection and personnel dosimetry to ensure doses are kept as low as reasonably achievable, will be completed. All decommissioning workers would be classified as Nuclear Energy Workers. Workers will be required to be monitored for uranium uptake as are current production workers. They will be required to wear personal protective equipment at all times when in the working area. The existing change facilities, worker staircases, and lunch room facilities will be used as they are used for current production workers.

Final End-State Objectives

The end-state objective of the decommissioning strategy is the unrestricted release of the entire licensed property from regulatory control. As such there is no predicted requirement for long-term institutional controls. Costs for refurbishment or demolition of the structures at the conclusion of the decommissioning are outside the scope of the PDP.

Cost Estimate

The cost estimate includes all labour, material, equipment, site operating expenses, CNSC regulatory fees, waste packaging, transportation and disposal costs required to decommission the facility to the end-state objective of unrestricted release for either reuse or demolition.

The total cost for decommissioning the site is estimated to be \$20,429,189 in 2027 Canadian dollars.

BWXT NEC has requested that the financial guarantee instrument be a combination of Surety Bond and Letter of Credit, with the first \$1,309,094 being satisfied by a letter of credit. The remaining obligation would then be satisfied by surety bond.

Until such time as the updated PDP amounts and financial instruments are approved, BWXT NEC maintains the existing financial guarantees.

Conclusions

BWXT NEC will undertake periodic reviews of the PDP and update it as required. The updates will reflect any changes to operations, conditions, evolving technologies and regulatory requirements.

Unless otherwise dictated by significant changes to the facility, the PDP will be updated every five years.

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