



Supplementary Information

Renseignements supplémentaires

Written submission from Ontario Power Generation

Mémoire d' Ontario Power Generation

In the Matter of

À l'égard d'

Ontario Power Generation

Ontario Power Generation

**Ontario Power Generation – Application to
change the licensing basis for the Pickering
Waste Management Facility**

**Ontario Power Generation – Demande
visant à modifier le fondement
d'autorisation de l'installation de
gestion des déchets de Pickering**

Public Hearing – Hearing in writing based on
written submissions

Audience publique – Audience fondée sur
des mémoires

June 2024

Juin 2024

July 11, 2024

CD# 92896-CORR-00531-01564 P

Ms. Candace Salmon
Commission Registrar
Canadian Nuclear Safety Commission
P.O. Box 1046
280 Slater Street
Ottawa, Ontario, K1P 5S9

Dear Ms. Salmon:

Pickering Waste Management Facility - OPG Response to the Commission Panel Members Questions Regarding the Application to Amend the Licensing Basis for the Storage of Minimum 6-Year Cooled Fuel

The purpose of this letter is to provide the Canadian Nuclear Safety Commission (the Commission) with a response to the questions Commission Panel Members addressed to OPG in CMD 24-H102-Q (Reference 1).

The questions are in consideration of OPG's request to amend the licensing basis for the Pickering Waste Management Facility (PWMF) Waste Facility Operating Licence WFOL-W4-350.00/2028, to be able to process and store minimum 6-year cooled fuel from Pickering NGS.

Attachment 1 provides OPG's responses to the Commission Panel Members questions from Table 1 of CMD 24-H102-Q (Reference 1).

Additional space is required in the Pickering NGS-B Irradiated Fuel Bay (IFB-B) in order to accept the discharged used fuel from required core defuels. As OPG is only licensed to process and store minimum 10-year cooled fuel at all its Nuclear Waste Facilities, the PWMF currently waits for IFB-B used fuel to mature to the 10-year required period before transferring. The requested amendment to the licensing basis to accept minimum 6-year cooled fuel would allow for this additional space.

The design considerations of the storage of minimum 6-year cooled fuel comply with all applicable regulatory requirements and the safety case demonstrates that the storage of minimum 6-year cooled fuel will have no significant impact on the continued safe operation of the PWMF, nor on public, employee, and environmental safety.

OPG remains committed to the safe operation of the PWMF and reaffirms that minimum 6-year cooled fuel can be stored safely.

Should you have any questions, please contact Ms. Kristina Brama, Director, Nuclear Regulatory Affairs Strategy, at (905) 706-3391.

Sincerely,



Kapil Aggarwal, M. Eng., P. Eng.
Vice President
Nuclear Sustainability Services
Ontario Power Generation Inc.

Attach.

cc: K. Campbell - CNSC (Ottawa)
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References: 1. Registry/Registrar email, C. Salmon to K. Aggarwal, " CMD 24-H102-Q - Questions from the Panel of the Commission: Hearing in Writing - OPG - Application for Amendment to the Pickering Waste Management Facility Licence", July 3, 2024, e-Doc# 7314620, CD# 92896-CORR-00531-01576.

ATTACHMENT 1

OPG letter, K. Aggarwal to C. Salmon, "Pickering Waste Management Facility - OPG Response to the Commission Panel Members Questions Regarding the Application to Amend the Licensing Basis for the Storage of Minimum 6-Year Cooled Fuel"

CD# 92896-CORR-00531-01564 P

Responses to the Commission Panel Members Questions from Table 1 of CMD 24-H102-Q

Prepared by: B. McMillan

Checked by: A. Halane

ATTACHMENT 1

Responses to the Commission Panel Members Questions from Table 1 of CMD 24-H102-Q

#	Commission Questions	OPG Response
Table 1 of Reference [1]		
1.	<i>Provide a brief explanation of mechanism by which placing Dry Storage Containers (DSCs) containing 10-year cooled fuel around the DSCs containing the 6-year cooled fuel provides additional shielding.</i>	This configuration is an As-Low-As-Reasonably-Achievable (ALARA) measure which increases the amount of material (i.e., other Dry Storage Containers (DSCs)) through which radiation from a minimum 6-year cooled fuel DSC must pass before reaching dose points in and around Storage Building 3 (SB3). As the decay age of used CANDU fuel increases, its dose rate profile decreases, thus placing minimum 10-year cooled fuel DSCs around the DSCs containing minimum 6-year cooled fuel will help keep dose rates in that aisle, and outside the building, ALARA.
2.	<i>Does OPG have a plan to improve the accuracy of their analysis models that predict temperatures in the DSCs, and radiation fields, to create modelling that more accurately reflects field measurements?</i>	In preparation for the processing and storage of DSCs containing minimum 6-year cooled fuel, OPG has completed a robust set of analyses to model the bounding temperature and radiation profiles of these DSCs. Analyses include assessment of key temperature properties of the DSC during processing, as well as profiling temperatures within SB3 when up to 100 DSCs (bounding scenario) containing minimum 6-year cooled fuel are staged for interim storage. Likewise, dose rates for DSCs containing 6-year cooled fuel have been assessed to ensure they will fall within all relevant design and regulatory thresholds. Regarding our existing site safety analysis, there is currently no plan to modify the safety analysis to better predict actual field measurements. Software codes are validated and confirmed appropriate as per Canadian Standards Association N-286.7-16, <i>Quality assurance of analytical, scientific, and design computer programs</i> requirements. With respect to Safety Analysis, models use conservative inputs and assumptions to predict worst case values to demonstrate that real-world conditions will be below the predicted results.
3.	<i>Has OPG reviewed the 1998 field measurements following the results of analysis modelling, to re-confirm that the field measurements are an appropriate representation of conditions for 6-year spent fuel in general?</i>	The loading, processing and interim storage of a DSC containing four modules of 6-year-old used fuel was safely and successfully completed in May 1998 at Nuclear Sustainability Services – Pickering Waste Management Facility (NSS-PWMF). Authorization at the time was given by the Atomic Energy Control Board. Both the 1998 field data and recently conducted analysis modeling were used to confirm that this modification meets DSC design and safety requirements.

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Table 1 of Reference [1]		
4.	<p><i>What are the specific backout parameters which would trigger reversing loading of the test DSCs?</i></p>	<p>There are two key temperature thresholds pertaining to DSC processing.</p> <ol style="list-style-type: none"> 1) The DSC flange must be below 50 degrees Celsius to conduct post-weld inspection of the Lid-to-Base weld as per the existing Phased Array Ultrasonic Testing (PAUT) equipment requirement. However, exceeding this temperature on its own would not trigger reverse loading. Should this threshold be exceeded, OPG Operations will extend the post-weld cooling period before PAUT inspection can be conducted. 2) The interior temperature of the International Atomic Energy Agency (IAEA) Seal Tubes must be below 70 degrees Celsius to maintain the integrity of the existing IAEA seals. As noted in the IAEA proposed testing process, the IAEA has indicated that seal alternatives will be pursued if conditions are identified that make the existing seal unsuitable for use on DSCs containing minimum 6-year cooled fuel. <p>If either of these temperature requirements cannot be met during DSC processing, then the DSC cannot be fully processed. A DSC that cannot be fully processed would need to be reverse loaded if no suitable mitigating actions are identified to resolve the issue.</p>
5.	<p><i>What monitoring activities will be implemented to track real world data against modelled expectations?</i></p>	<p>During the commissioning phase, the DSCs will be radiation dose rate and temperature monitored according to the following criteria:</p> <ol style="list-style-type: none"> 1) Temperature measurements will be taken in stages over a period of approximately five weeks after the DSC has been loaded – while the DSC is in the NSS-PWMF Processing Area and under surveillance. Temperature measurements will be taken periodically over a 3-week period following the loading of the DSC but prior to DSC processing. Temperature measurements will further be taken before each major step of DSC processing: <ul style="list-style-type: none"> • Before application of Weld Pre-Heater • Before PAUT Weld Inspection • Before Vacuum Drying and Helium Backfill • Before DSC Drain Plug Welding

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		<ul style="list-style-type: none"> • Before Helium Leak Test • Before Application of Safeguard Seals • Before DSC transfer to SB3 <p>2) Temperature measurements will be taken:</p> <ul style="list-style-type: none"> • On two adjacent sides of the DSC, with the assumption that opposite sides have similar temperatures and dose rates due to DSC symmetry and overall homogeneity of the used fuel. • Within the IAEA Seal Tubes at a minimum of three locations (inlet, mid-point, bottom). • Weld Flange Temperature measurements will be taken following welding but prior to PAUT. <p>3) Dose Rate Measurements will be taken at the following locations:</p> <ul style="list-style-type: none"> • On contact and at 1 m distance (at any accessible point from the sides and the lid top) • At all IAEA Seal Tube inlets • At least two accessible locations on the Lid-to-Base weld surface (on two adjacent sides of the DSC). • At a series of distances from contact to 500 cm away from the DSC surface. This series of measurements will be performed for two adjacent sides of the DSC and the top of the DSC.
6.	<p><i>What is the nature of the test equipment used to validate the test DSCs for temperature and radiation fields?</i></p>	<p>For the temperature measurements, the following instruments will be used:</p> <ol style="list-style-type: none"> 1) X-Lab External Temperature Sensor Model TP-100-TH (x 2) N-SPEC-60270-00007, TP-100-TH R001 Technical Specifications Brochure; 2) Omega Flexible Sealed PFA RTD Sensors Model HSRTD-3-100-A-240-MTP (x 2); and 3) Data Logger Model P-GTW-BL300 (x 1) N-SPEC-60270-00006, P-GTW-BL300 R001 Technical Specifications Brochure. <p>These items will be used to take temperature measurements at the inlets of the IAEA Seal Tubes as well as at specified locations within the IAEA Seal Tubes using braided steel fish tape.</p>

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Table 1 of Reference [1]		
		<p>For the radiation field measurements, the following instruments will be used:</p> <ol style="list-style-type: none"> 1) Standard BOT P1000 and/or BOT P200 gamma meter to assess gamma radiation levels; and 2) Scintrex Neutron NP-100 Meter to assess Neutron radiation levels.
7.	<p><i>Should the DSC 6-year dry fuel models prove correct, when is the earliest time that the balance of the 100 DSCs will be loaded - both commencement and intended competition dates?</i></p>	<p>Following the commissioning phase, OPG's current schedule to load minimum 6-year cooled fuel is targeted to commence in Q3 2025 with an estimated completion in Q4 2028. The Licence amendment for this modification will allow storage of up to 100 DSCs containing minimum 6-year cooled fuel at the NSS-PWMF in SB3. Once fuel in DSCs loaded with younger fuel matures to a cooling period of 10 years, the DSC will be treated as existing DSCs in the Used Fuel storage buildings and would not be considered as part of the 100 DSCs containing younger fuel (i.e., the DSC will be moved out of the approved younger fuel designated storage area in SB3).</p>
8.	<p><i>When are the 2 full unit core unloading activities scheduled to commence in Fuel Bay B?</i></p>	<p>To create additional space in the Irradiated Fuel Bay-B (IFB-B) for core defuel/unloading of all four Pickering NGS-B Units 5 through 8, the current defuel/unloading activities are targeted to commence in Q3 2026.</p>
9.	<p><i>Are the long-term monitoring activities of the 6-year fuel DSCs any different than the 10-year fuel DSCs. If so, why?</i></p>	<p>Long-term monitoring activities of the minimum 6-year cooled fuel DSCs will remain consistent with OPG's existing Used Fuel Dry Storage Container Aging Management Plan which governs the evaluation and assessment of aging effects on our DSC inventory. As established under our existing process, the Aging Management Plan will be reviewed and updated as necessary to account for any indications of change in the condition of DSCs over time or based on the results of periodic aging monitoring activities.</p>
10.	<p><i>Is OPG in discussions with Mississaugas of Scugog Island First Nation regarding future consultation or collaborative, given decision-making, for nuclear spent fuel which is held on site?</i></p>	<p>OPG's Pickering NGS and NSS-PWMF are located on Williams Treaties First Nations (WTFN) traditional and Treaty Territory. OPG values the relationship it holds with the WTFN and remains committed to meaningful engagement with these Rights Holders, including the Mississaugas of Scugog Island First Nation.</p> <p>Nuclear spent fuel from Pickering NGS, which is stored on an interim basis at the NSS-PWMF, is included as an agenda item at existing Framework meetings with the WTFN. A Memorandum of Understanding to support the Pickering NGS Indigenous Engagement Plan (IEP) is currently with the WTFN for review.</p>

#	Commission Questions	OPG Response
Table 1 of Reference [1-1]		
		<p>Additionally, throughout Q1 and Q2 2024, OPG has been engaging and collaborating with Mississaugas of Scugog Island First Nation to understand and support a benchmarking of best practices request related to the interim storage of used fuel onsite. We have also provided supporting documents that show how OPG's used fuel dry storage containers adhere to international standards and best practices, including those of the IAEA. OPG is continuing to work together with Mississaugas of Scugog Island First Nation to support this request in Q3 2024.</p>
11.	<p><i>What are the current communication practices employed by OPG, with regard to concerns raised by Indigenous Nations and communities surrounding spent fuel at PNGS?</i></p>	<p>OPG communicates regularly with Indigenous Nations and through various activities including Framework meetings, written communication and/or workshops as outlined in the Pickering NGS IEP. The objective is to ensure there is an established forum for two-way dialogue with Indigenous Nations and communities for Pickering NGS, including the NSS-PWMF, which provides capacity support to discuss key topics of Indigenous interest.</p> <p>Additionally, OPG recognizes the interest that WTFN has in waste and decommissioning activities associated with OPG Operations and in Q2 2024, a specific waste table forum was suggested, which we are currently in discussions with the Nations on developing and implementing.</p>

References: [1-1] Registry/Registrar email, C. Salmon to K. Aggarwal, " CMD 24-H102-Q - Questions from the Panel of the Commission: Hearing in Writing - OPG - Application for Amendment to the Pickering Waste Management Facility Licence", July 3, 2024, e-Doc# 7314620, CD# 92896-CORR-00531-01576.

Summary of Regulatory Commitments, Regulatory Obligations and Regulatory Management Actions Made/Concurrence Requested

CD# 92896-CORR-00531-01564 P

Submission Title: Pickering Waste Management Facility - OPG Response to the Commission Panel Members Questions Regarding the Application to Amend the Licensing Basis for the Storage of Minimum 6-Year Cooled Fuel

Regulatory Commitments (REGC):

No.	Description	Date to be Completed
	None	

Regulatory Management Action (REGM):

No.	Description	Date to be Completed
	None	

Regulatory Obligation Action (REGO):

No.	Description	Date to be Completed
	None	

Concurrence Requested: None.