Board Staff Interrogatory #213

Interrogatory

Reference:
Exhibit F2 / Tab 1 / Schedule 1 / pp. 25-28

Preamble:

OPG noted that for the Pickering NGS Units 5-8 to operate beyond 2024, OPG is required to complete a reassessment of the continued validity of the Periodic Safety Review (PSR), revise the Integrated Implementation Plan (IIP) actions as required, and notify the CNSC of the results of both by December 31, 2022, in support of an application for a licence amendment. In addition to the PSR reassessment, OPG noted that it will execute its Fuel Channel Life Cycle Management Plan and complete Component Condition Assessments to ensure that Pickering NGS components can be safely operated to 2025. OPG stated that it will continue, leading up to the CNSC submission, to validate technical analysis to support CNSC approval to operate Pickering NGS units to 2025.

Question(s):

a) What type of description / criteria does OPG use to define what constitutes an IIP-type action? Please provide relevant materials, such as charters, business cases or internal documentation, that define / establish such criteria.

b) Please identify whether efforts toward the PSR reassessment and IIP action revision have begun. If so, please comment on the status of these efforts. In the response, please identify all anticipated IIP actions that will be undertaken during the 2022 to 2026 period.

c) Using the tabular format outlined below, please provide the details and costs associated with all IIP actions started or completed since January 1, 2018.

IIP Action Name	IIP Action Description	Year Started	Year Completed	Cost ($M)

d) Please identify whether any of the completed or planned IIP activities directly or in-directly support the actual shutdown of Pickering NGS. If so, please identify the activities and their associated costs.

e) Please identify whether the CNSC had any concerns with the PSR submitted as part of Pickering NGS's re-licensing in 2018. In the response, please identify

specific CNSC concerns that were raised, if any, and detail if OPG is addressing such concerns in this iteration of the PSR. If applicable, please clearly identify the actions being undertaken and their associated costs.

f) Please provide an update on the status of the CNSC approval that is required to operate Pickering NGS Units 5-8 past 2024. If there are any developments that may impact the Pickering Optimized Shutdown, please advise.

g) Please confirm that if OPG were to not receive the license amendment from the CNSC the result would be that Units 5-8 would be shutdown by the end of 2024 (along with Units 1 and 4).

h) Please outline OPG's preferred contingent approach to either changing payment amounts or recording balances should any Pickering NGS unit not be allowed to operate until the targeted shutdown date at the end of 2025.

i) Please identify whether OPG has evaluated de-rating any of the Pickering NGS units to ensure its continued operation to 2025. In the response, please identify whether OPG has conclusively decided to de-rate or plans to evaluate de-rating any of the Pickering NGS units between 2021 and 2025.

j) Please identify all planned component replacements or refurbishments with a material total cost (capital, and non-capital) that will be undertaken because of a Component Condition Assessment.

k) Please advise whether OPG has any ongoing preliminary contingencies involving the operation of any Pickering NGS units past the current 2025 target of the Pickering Optimized Shutdown. If so, please discuss those contingencies, provide the associated costs of such contingencies, and describe whether any costs are recorded in the proposed 2022-2026 revenue requirement or any of OPG's DVAs.

l) Based on the current outage frequency, please identify the year that each Pickering NGS unit will achieve 295,000 EFPH. As applicable, please provide commentary for any Pickering NGS unit that achieves this threshold prior to, or subsequent to, 2025.

Response

a) OPG uses the criteria set out by the Canadian Nuclear Safety Commission ("CNSC") to define what constitutes an IIP action. See REGDOC-2.3.3, Periodic Safety Reviews Report, which outlines the specific criteria (Ex. A1-6-1, Attachment 4, Section 6).

b) Efforts towards assessment of PSR and IIP action have began. Please refer to Chart 1 below for details.

Chart 1

Activity	**Target Completion Date***
Global Issue (GI) Assessment report prepared	August 2021
Global Assessment Report (GAR) submitted for CNSC review	January 2022
GAR revision completed	February 2022
IIP submitted for CNSC review	June 2022
IIP acceptance by CNSC	August 2022**

* Proposed target dates from OPG; expected to be confirmed by the CNSC in 2021.
** IIP Document will list the corrective actions and safety improvements that will address all gaps identified in the PSR, and findings. The document will also specify the schedule for implementing the corrective actions and safety improvements.

c) Please see Chart 2 below for IIP actions completed since January 1, 2018. These actions relate to Pickering Extended Operations only (i.e. extending the life of Pickering Units 1 and 4 to 2022 and Pickering Units 5 to 8 to 2024).

No IIP actions have commenced for the Optimization of Pickering's Shutdown (i.e. operating Pickering Units 1 and 4 to 2024 and Pickering Units 5 to 8 to 2025). As mentioned in part (b) of this response, the acceptance of the IIP related to the Optimization of Pickering Shutdown from the CNSC is targeted for August 2022. IIP actions will commence following the acceptance.

Chart 2

IIP Action Name	**IIP Action Description**	**Year Started**	**Year Completed**	**Cost ($M)**
GI-27: Pickering 1,4 Probabilistic Safety Assessment	Investigate and implement additional practicable design, operational and/or analytical enhancements to further improve Pickering Units 1 and 4 Severe Core Damage Frequency and Large Release Frequency (e.g., alternative emergency cooling water makeup).	2017	2020	11.1

GI-48: Compliance with CSA N293-12 Fire Protection of Nuclear Power Plants	In order to meet the safety intent of CSA N293-12 Clause 7.3.2.2 (d), OPG to provide, as required, design and/or operational changes and commissioning/testing to facilitate the required interconnection of Pickering Units 1 and 4 and Pickering Units 5-8 Fire Protection System water supplies			
GI-40: Accident Management	Complete the planned Phase 2 Emergency Mitigating Equipment (EME) implementation. This includes supplying cooling water, and power to essential loads via EME generators, to allow for operation of Air Cooling Units (ACUs) and Hydrogen Igniters.	2018	2019	0.5
IIP Project Management	Manage the IIP	2019	2021	2.1
GI-08: Completion / Updating of the Condition Assessments	Complete and update Condition Assessments (CA) for the piping systems and commodity groups in PSR2 scope for the extended operating period (i.e. Units 1 and 4 to 2022; units 5 to 8 to 2024)	2019	2019	0.0050
GI-19: FFS of Containment for the Extended Operating Period	Demonstrate the Fitness for Service (FFS) of the foundation steel H-piles for the Pickering A Reactor Building, Vacuum Building, and Pressure Relief Duct at the Pickering site for the extended operating period (i.e. Units 1	2018	2019	0.8

	and 4 to 2022; Units 5-8 to 2024)			
GI-43 (Partial) (Safety-Related Structures (Non-Containment) for Nuclear Power Plants)	Prepare Condition Assessments as appropriate for safety-significant civil structures for the extended operating period (i.e. Units 1 and 4 to 2022; Units 5-8 to 2024). Recommendations from these Condition Assessments will be tracked and reported along with those related to GI-08. This applies to non-Containment Safety-Related Civil Structures.	2019	2019	1.5
GI-12 EQA Revision	Complete Environmental Qualification Assessments re-assessments to support the extended operating period.	2019	2019	1.1
Re-screening Rationalization Work	Re-screening Rationalization Work	2019	2019	0.5

The costs above are related directly to the management and execution of the IIP. These actions relate to Pickering Extended Operations only (i.e. extending the life of Pickering Units 1 and 4 to 2022 and Pickering Units 5 to 8 to 2024).

d) As per question (b), the PSR2A is underway; the GAR and IIP will become available at the end of 2022. Upon completion of the IIP, OPG will be in the position to identify whether any of the completed or planned IIP activities directly or in-directly support the actual shutdown of Pickering NGS.

e) The CNSC did not identify any concerns with the PSR submitted as a part of Pickering NGS's re-licensing in 2018.

f) OPG is currently tracking to submit by December 31, 2022 a notification of intent to operate Pickering Units 5-8 until the end of December 2025 as required by the CNSC.

g) Confirmed.

h) If the CNSC were not to permit any Pickering NGS unit to operate until its targeted shutdown date, OPG would notify and consult with the OEB and OEB staff, as appropriate, with respect to the circumstances and, further to such consultation, OPG would file for and the OEB would decide upon the appropriate regulatory treatment.

i) OPG has not evaluated and does not intend to derate any Pickering NGS units to ensure its continued operation to 2025.

j) OPG is currently completing its Component Condition Assessment to enable safe operations beyond 2024. The assessment is targeted for completion in 2021. Upon completion, the cost of replacing and refurbishing components can then be confirmed.

k) OPG's plan is to operate all six units to 2024 with four units continuing to operate in 2025. OPG does not have contingencies involving the operation of Pickering's units past December 2025.

l) OPG interprets "current outage frequency" to be OPG's current production forecast. Chart 3 below provides the year in which each Pickering unit is projected to achieve 295,000 Equivalent Full Power Hours ("EFPH").

Chart 3

Unit	Year to Reach 295,000 EFPH
Pickering 1	2037
Pickering 4	2040
Pickering 5	2026
Pickering 6	2025
Pickering 7	2026
Pickering 8	2028

Based on current forecasts, all of the Pickering units reach 295,000 EFPH after their planned shutdown dates. Pickering Unit 6 is projected to reach 295,000 EFPH in Q4 2025.