2019

DEPRECIATION REVIEW COMMITTEE RECOMMENDATIONS

FOR

NUCLEAR

MARCH 2020

MEMORANDUM **March 2020**

2019 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2019 Depreciation Review Committee (DRC) review of the average service lives of the selected asset classes and the station service lives for OPG's nuclear facilities. The nuclear facilities are the Pickering Nuclear Generating Station, the Darlington Nuclear Generating Station and the Bruce Nuclear Generating Stations.

BACKGROUND

The DRC convenes annually to review the service lives for depreciation purposes of OPG's major facilities and a selection of asset classes in those facilities, with the general objective of reviewing all significant asset classes over a five year period. OPG's practice of reviewing asset classes over an approximate five-year cycle to re-evaluate the average service life estimates was considered appropriate by Gannett Fleming ULC (GF), an external consultant. In the recommendation section of the report dated November 29, 2013 that was accepted by the Ontario Energy Board (OEB) as part of OPG's application for 2014/15 payment amounts, GF noted "[c]ontinued surveillance and periodic revisions are required to maintain use of appropriate average service lives and depreciation rates. Each [asset class] account should be subjected to a complete depreciation study to re-evaluate its average service life estimates periodically. Gannett Fleming notes that the practice of OPG to review its various asset accounts and depreciation service lives over an approximate five-year cycle meets this common depreciation practice."

This is the second year of the DRC's current five year review period, with the next independent study for the nuclear assets anticipated to take place in 2020, allowing for the substantial in-service additions associated with the refurbishment of Unit 2 at the Darlington Generating Station (GS) to be reviewed. In its December 2017 decision and order on OPG's 2017-2021 rate application, the OEB indicated that it did not have concerns with an approach that aligned the timing of the next independent study with the return to service of Unit 2 at Darlington GS.

SCOPE OF 2019 DRC REVIEW FOR NUCLEAR

Station Service Lives

The DRC has confirmed with the nuclear business units that no new information became available in 2019 that would require any change in the station end-of-life (EOL) dates of the nuclear stations. The following average nuclear station EOL dates are recommended to remain effective from December 31, 2019.

Darlington	December 31, 2052
Pickering Units 1 and 4	December 31, 2022
Pickering Units 5-8	December 31, 2024
Bruce A	December 31, 2052
Bruce B	December 31, 2061

The current approved Pickering EOL reflect high technical confidence in OPG's previously announced plan for extending the station's operation up to 2024, based on the programs and provisions in place to assure fitness-for-service of fuel channel components. Fuel channels were determined to be the overall life-limiting component of the station's continued operation. The current operating licence from the Canadian Nuclear Safety Commission allows for commercial operation of the station to December 31, 2024.

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OPG has completed preliminary assessments which demonstrated that further optimization of the end of operations dates for the Pickering GS units is safe, technically feasible and would result in incremental economic and other benefits to the province and to OPG. As a result, for the 2019 DRC recommendations, consideration was given to the potential to extend the Pickering EOL dates based on OPG's plan for a further optimized shutdown sequence of the units, in 2024 for Units 1 and 4 and in 2025 for Units 5-8. The plan is based on a business case that demonstrates that the optimization will deliver incremental value to customers through economic and operational benefits to Ontario's electricity system.

Although the business case has been approved by OPG's Board of Directors and is supported by the Independent Electricity System Operator, the DRC concluded that OPG does not yet have the required high confidence to extend the accounting EOL dates beyond the current approved accounting dates. This recommendation is based on the status of regulatory work in support of obtaining CNSC's regulatory approval, through a public hearing process, necessary for operation of the station beyond December 31, 2024 and the status of the technical work to confirm the applicable units' fitness-for-service to achieve the additional life beyond 2024, including further assurance of fitness-for-service for fuel channel components. As part of the regulatory approval process, OPG would have to demonstrate safe operation of the units through the extended period of operation by following certain criteria set forth as part of the Licence conditions granted to OPG.

While the operation of Units 1 and 4 to 2024 does not require further regulatory approvals from the CNSC and falls within the design of the current programs and provisions in place to assure the fitness-for-service for fuel channel components, the DRC noted that high technical confidence related to the continued fitness-for-service of certain steam generators at Unit 4 has not yet been achieved. Inspection and analysis work to confirm such high confidence is currently targeted for completion by 2021 at the latest. Steam generators are considered to be a life-limiting component.

The 2020 DRC review will consider the status of regulatory and technical work related to the operation of the station beyond December 31, 2024, as well as the status of the technical high confidence with respect to the operation of Units 1 and 4 to 2024, to determine if the required confidence to extend the current accounting EOL dates has been demonstrated.

Asset Class Review

Seven nuclear Major and one nuclear Minor fixed asset classes were selected for the 2019 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (greater than $5M) that had not been reviewed by the DRC as part of the current review cycle and assets identified for review by business unit/site contacts based on operational knowledge.

The asset classes selected for review were as follows:

Asset Class
15121000 – Nuclear Electronic Site Security Systems
15352100 – Nuclear Shutdown Cooling Heat Exchangers – Darlington
15370000 – Nuclear Tritium Removal Facility – Darlington
15400000 – Nuclear Turbines, Auxiliary Equipment, Steam Reheater Tubes – PA & BG
15450000 – Nuclear Condenser Tubing – Pickering & Bruce A
15461000 – Nuclear Auxiliary Systems – PB & Darlington
15701000 – Nuclear Service Water & Fire Protection System

Asset Class
Removal Tools for Darlington Refurbishment

Excluding asset retirement costs and other asset classes with service lives that are tied directly to the overall station service lives, 64% of the total in-service net book value of the fixed asset classes of the nuclear business as at December 31, 2019 have been covered by the 2018 and 2019 DRC reviews. Asset classes with services lives tied directly to the overall station services lives are considered to be reviewed each time the DRC reviews the station end of life dates.

SUMMARY OF RECOMMENDATIONS

Sources of Information

The main sources of information considered by the DRC in developing the recommendations included:

- reviews conducted primarily by technical staff in the nuclear business unit;
- information obtained from past DRC reviews; and
- industry experience

Asset Class Review

The 2019 DRC review of the average service lives of the nuclear facilities determined that the currently approved average service life estimates for all reviewed asset classes remain appropriate. These recommendations were reviewed with and endorsed by business and technical staff responsible for overseeing the nuclear assets. Below is a summary of conclusions for the reviewed asset classes:

Asset Class	Recommendation
15121000 – Nuclear Electronic Site Security Systems	Retain the current service life of 15 years
15352100 – Nuclear Shutdown Cooling Heat Exchangers – Darlington	Retain the current service life of 30 years
15370000 – Nuclear Tritium Removal Facility – Darlington	Retain the current service life of 30 years
15400000 – Nuclear Turbines, Auxiliary Equipment, Steam Reheater Tubes – PA & BG	Retain the current service life of 40 years
15450000 – Nuclear Condenser Tubing – Pickering & Bruce A	Retain the current service life of 30 years
15461000 – Nuclear Auxiliary Systems – PB & Darlington	Retain the current service life of 55 years
15701000 – Nuclear Service Water & Fire Protection System	Retain the current service life of 25 years
Removal Tools for Darlington Refurbishment	Retain the current service life ending in 2024

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DRC MEMBERS AND APPROVALS COMMITTEE

The DRC includes representatives from the operating business units as well as representatives having experience in finance and accounting, investment planning, and rate regulation.

The Approvals Committee is responsible for approving the DRC recommendations and, as it relates to the nuclear business, is comprised of the following individuals:

Name	Position
Dominique Minière	President, Nuclear
John Mauti	Chief Financial Officer and Senior Vice President, Finance
Chris Ginther	Chief Administrative Officer

The DRC is comprised of the following members:

Name	Position
Barbara Kerr	Vice President, Controllership
Michael Gore	Director, External Reporting and Accounting Policy
Harvey Hui	Senior Manager, Accounting and Reporting
Nadira Singh	Vice President, Business Planning and Reporting
Lyndsey Arseneau	Director, Ontario Regulatory Affairs
Angelo Pavia	Senior Manager, Investment Management, Nuclear Finance

The Key Technical Contacts are:

Name	Position
Angelo Pavia (Technical Coordinator for Nuclear)	Senior Manager, Investment Management, Nuclear Finance