2016

DEPRECIATION REVIEW COMMITTEE RECOMMENDATIONS

FOR

NUCLEAR

DECEMBER 2016

MEMORANDUM **December 2016**

2016 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2016 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 prescribed nuclear facilities are the Pickering Nuclear Generating Station and Darlington Nuclear Generating Station.

The 2016 DRC review recommends the following for depreciation purposes, effective January 1, 2017, for the selected nuclear asset classes reviewed.

- 15120 – Yard Facilities: **Retain the current 50 year average service life and establish a new asset class with a 20 year average service life to separate nuclear fencing from yard facilities**
- 15511 – Station Service Main Transformers and AC Power Distribution Systems - Pickering Units 5-8 and Darlington: **Decrease average service life from 55 to 40 years**
- 15500 – Main Power Output System: **No change to average service life**
- 15510 – Station Service Main Transformers and AC Power Distribution Systems - Pickering Units 1 and 4 and Bruce: **No change to average service life**
- 16310 – Administration and Service Buildings – Nuclear Training Simulators: **No change to average service life**
- 153411 – Moderator Heat Exchangers-Pickering: **No change to average service life**

These recommendations will result in an annual nuclear depreciation expense increase of approximately $1.5M.

There is no recommendation for a change in service life of the operating nuclear stations. The following average nuclear station end of life (EOL) dates which were effective December 31, 2015, continue to be used:

Darlington	December 31, 2052
Pickering Units 1 and 4	December 31, 2020
Pickering Units 5-8	December 31, 2020
Bruce A	December 31, 2052
Bruce B	December 31, 2061

BACKGROUND

The DRC is convened annually to review the service lives for depreciation purposes of OPG's major facilities and/or 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 Gannet 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 in the application for 2014/15 payment amounts, GF noted "Continued 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. Gannet 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." The current five year review period started in 2013.

The 2013 independent depreciation study performed by GF reviewed the estimated average asset class lives and station service lives for the property, plant and equipment, including intangible assets, of the nuclear and hydroelectric prescribed facilities, including the newly regulated hydroelectric facilities, based on in-service balances as at December 31, 2012, as well as the Niagara Tunnel. GF provided their findings in their report dated November 29, 2013 that was accepted by the OEB in the application for 2014/15 payment amounts.

SCOPE OF 2016 DRC REVIEW FOR NUCLEAR

The focus of the of the DRC was to review a selection of nuclear asset class service lives as well as confirm OPG's nuclear station service lives. The review focused on the following main areas:

- **Asset class review** – six nuclear asset classes were selected for the 2016 DRC review. The asset classes to be reviewed were determined by selecting the higher value asset classes that had not been previously reviewed by the DRC as part of the current review cycle. The business unit/site contacts did not identify any additional asset classes for review.
- **Nuclear station service lives review** – to assess whether there is any new information pertaining to nuclear station lives that would warrant changes based on the principle of high confidence

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.

Excluding asset retirement costs, more than 85% of the in-service net book value of the major fixed asset classes as at December 31, 2015 of the nuclear business, have been covered by the 2013 to 2016 DRC reviews.

SUMMARY OF RECOMMENDATIONS

Asset Class Review

The DRC review of the average service lives of the nuclear facilities determined that, except for asset class 15120, Yard Facilities, and asset class 15511, Station Service Main Transformers and AC Power Distribution Systems, the currently approved average service life estimates for all reviewed asset classes are 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.

- 15120 – Yard Facilities: Security fencing makes up the majority of the net book value of this asset class and has a design life of 20 years. *It is recommended to establish a new asset class with a 20 year average service life to separate fencing from other assets within this asset class. This will result in an annual increase in depreciation of approximately $1.5M. The current 50 year average service life for the assets remaining in the Yard Facilities asset class will be retained.*
- 15511 – Station Service Main Transformers and AC Power Distribution System - Pickering Units 5-8 and Darlington: Plant condition assessments and engineering assessments indicate that the asset class life should be 40 years rather than the current 55 years. *It is recommended that the service life of this asset class be decreased from 55 to 40 years. There is no impact on depreciation, as the EOL dates of Darlington (2052) and Pickering (2020) are the life limiting factors for these assets.*
- 15500 – Main Power Output System: *Retain current 35 year average service life*
- 15510 – Station Service Main Transformers And AC Power Distribution Systems - Pickering Units 1 and 4 and Bruce: *Retain current 40 year average service life*
- 16310 – Administration and Service Buildings – Nuclear Training Simulators: *Retain current 45 year average service life*
- 153411 – Moderator Heat Exchangers-Pickering: *Retain current 25 year average service life*

Nuclear Station Service Lives Review

Pickering Station

The 2016 DRC is recommending that the average station end of life dates for depreciation purposes for Pickering Units 1 and 4 and Pickering Units 5-8 continue to remain unchanged at December 31, 2020. The 2015 extension of the Pickering Units 5-8 EOL to 2020 was based on the technical confirmation of high confidence, that all four Pickering Units 5-8 were expected to be fit to safely operate until at least December 31, 2020, received in 2015 based on the results of the fuel channel work. The 2016 DRC considered the potential to extend the Pickering station EOL date beyond 2020 and concluded that OPG currently does not have the necessary high confidence, for accounting purposes, of the units' fitness-for-service beyond that date.

In January 2016, OPG announced that it plans to pursue continued safe and reliable operation of the Pickering station beyond 2020. Under OPG's plan, all six operating units at the station would operate until 2022, at which point two units would be shut down and the remaining four units would continue to operate until 2024. Although OPG has increasing confidence that the Pickering fuel channels can safely operate to 2024 through work being completed as part of the fuel channel work program, OPG continues to undertake further technical and regulatory work to confirm that the Pickering pressure tubes will achieve the additional life predicted. The end of life for accounting purposes will be reassessed when this work confirms that the longer fuel channel life necessary to extend Pickering operations will be achieved.

Darlington Station

The average station end of life date for Darlington was previously established at December 31, 2052 in the 2015 DRC. This EOL was based on the November 2015 OPG Board of Directors' approval of the

budget and schedule for the four unit Darlington refurbishment, continuing to assume a 30-year post-refurbishment operating life. This EOL date remains unchanged.

Bruce Nuclear Generating Stations

Bruce A and Bruce B average end of life dates were previously established as December 31, 2052 and December 31, 2061, respectively in the 2015 DRC. These dates were based on the Amended and Restated Bruce Power Refurbishment Implementation Agreement between the Independent Electricity System Operator and Bruce Power made public December 2015. These EOL dates remain unchanged.

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 is comprised of:

- Glenn Jager, President, OPG Nuclear and Chief Nuclear Officer
- Mike Martelli, President, Renewable Generation & Power Marketing
- Ken Hartwick, Senior Vice President, Finance, Strategy, Risk and Chief Financial Officer
- Chris Ginther, Senior Vice President, Legal, Ethics & Compliance

The DRC is comprised of the following members:

- Glenn Inouye, Vice President, Shared Financial Services (DRC Chair)
- John Blazanin, Vice President, Nuclear Finance
- Lubna Ladak, Vice President, Renewable Generation & Power Marketing Finance*
- Jeffrey Hansen, Vice President, Strategic Operations, Renewable Generation & Power Marketing*
- Randy Pugh, Director, Ontario Regulatory Affairs
- Alec Cheng, Director, External Reporting and Accounting Policy
- Vassa Chase, Director, Accounting
- Dwight Zerkee, Senior Manager, Investment Management, Nuclear Finance

*Did not participate in the development of the nuclear report.