

DEPRECIATION AND AMORTIZATION

1.0 PURPOSE

This evidence describes the depreciation and amortization policy, provides the depreciation and amortization expense for OPG's regulated hydroelectric facilities and nuclear facilities, and the Darlington New Nuclear Program ("DNNP") facilities, and presents an independent review and assessment of the asset service life estimates for OPG's regulated assets.

2.0 OVERVIEW

This evidence supports the request for approval of depreciation and amortization expense for OPG's regulated nuclear facilities and the DNNP facilities for the IR term. Consistent with the Application's proposal to set hydroelectric payment amounts using a price-cap index Custom IR framework, it also supports the request for approval of the depreciation and amortization expense for OPG's regulated hydroelectric facilities for 2027. Depreciation and amortization amounts for the regulated hydroelectric facilities are also presented for 2028-2031, as they are used in the calculation of the custom capital factor for the annual adjustment mechanism for the hydroelectric payment amounts under the proposed price-cap index Custom IR framework. The proposed Custom IR framework for the regulated hydroelectric facilities is described in Ex. A1-3-2.

As discussed in Ex. A1-4-4, the Application reflects the anticipated transfer of OPG's DNNP construction assets to DNNP LP under a lease arrangement with OPG at the end of 2025. Section 14(2)2 of Ontario Regulation 53/05, ("O. Reg. 53/05") requires the OEB to accept as capital costs the cumulative prudently incurred costs: (i) forming part of the asset balances, in respect of any assets transferred from or licensed by OPG to DNNP LP in relation to the DNNP facilities, as reflected in the audited schedule of costs that is approved by OPG's Board of Directors; and, (ii) for any leasehold improvements made by DNNP LP in relation to the DNNP facilities. The depreciation of these assets is discussed in this exhibit.

The forecast depreciation and amortization expense for OPG's regulated hydroelectric facilities is \$215.4M for 2027, \$228.4M for 2028, \$249.6M for 2029, \$263.6M for 2030, and \$271.7M

1 for 2031 (Ex. F4-1-1, Table 1). The forecast depreciation and amortization expense for OPG's
2 regulated nuclear facilities is \$663.3M for 2027, \$708.5M for 2028, \$730.3M for 2029, \$779.8M
3 for 2030, and \$992.6M for 2031 (Ex. F4-1-1, Table 2). The forecast depreciation and
4 amortization expense for the DNNP facilities is \$0.0M in 2027, \$0.0M in 2028, \$0.0M in 2029,
5 \$22.6M for 2030, and \$109.7M in 2031 (Ex. F4-1-1, Table 2). The increases in forecasted
6 depreciation and amortization expense over the period reflect the increases in the forecast rate
7 base values, discussed in Ex. B1-1-1.

8
9 The evidence also presents depreciation and amortization expense for OPG's regulated
10 hydroelectric facilities for 2016-2024 (actual) and 2025-2026 (budget) and depreciation
11 amortization expense for OPG's regulated nuclear facilities for 2020-2024 (actual) and 2025-
12 2026 (budget). There is no depreciation and amortization expense for the DNNP facilities prior
13 to Unit 1 being forecast to enter commercial operation in 2030.

14
15 The depreciation expense for the Bruce assets is presented in Ex. G2-2-1.

16
17 Depreciation and amortization expense for the regulated nuclear and regulated hydroelectric
18 assets continues to be determined in the same manner as reflected in EB-2020-0290 and prior
19 OPG payment amounts proceedings. It is determined on the same basis for the purpose of
20 proposed revenue requirements and in OPG's financial statements. These practices will also
21 be applied to the DNNP facilities.

22
23 The OEB-approved Settlement Proposal in EB-2020-0290¹ and the OPG filing requirements
24 issued by the OEB in EB-2024-0136 require OPG to file, as part of this application, an
25 independent review and assessment of the asset service life estimates for OPG's regulated
26 nuclear and regulated hydroelectric assets. In 2024, OPG engaged Concentric Advisors, ULC
27 ("Concentric") to provide this assessment based on the net book values of OPG's in-service
28 assets as of December 31, 2024, for each of the regulated nuclear and regulated hydroelectric
29 businesses, including nuclear station end-of-life ("EOL") date assumptions (collectively, the
30 "2024 Depreciation Study"). The 2024 Depreciation Study is provided in Attachment 1 for the

¹ EB-2020-0290, Decision and Order, Schedule A, Appendix A, p. 2.

1 regulated nuclear business and Attachment 7 for the regulated hydroelectric business,
2 respectively.

3

4 OPG previously submitted a similar independent review and assessment of the asset service
5 life estimates, performed by Concentric,² for the regulated nuclear assets in EB-2020-0290
6 (“2020 Nuclear Depreciation Study”)³ and for both regulated nuclear and regulated
7 hydroelectric assets in EB-2013-0321 (“2013 Depreciation Study”).⁴ The OEB accepted the
8 results of the 2013 Depreciation Study in EB-2013-0321 and approved the Settlement
9 Proposal in EB-2020-0290 that reflected the results of the 2020 Nuclear Depreciation Study.
10 Since EB-2013-0321, OPG also engaged Concentric to conduct an independent review and
11 assessment of the regulated hydroelectric assets in 2019 (“2019 Hydroelectric Depreciation
12 Study”), provided in Attachment 12.

13

14 O. Reg. 53/05 has established a mechanism that provides for recovery of interest amounts
15 associated with the Pickering Refurbishment Program (“PRP”) and the Darlington New Nuclear
16 Program (“DNNP”) prior to such assets being placed in service, effective January 1, 2026. As
17 such, neither the PRP nor the DNNP in-service additions, rate base values or associated
18 depreciation and amortization expense presented in the Application include capitalization of
19 interest beginning in January 1, 2026.⁵ This concurrent cost recovery mechanism for both
20 projects is detailed in Ex. I1-1-3.

21

22 The revenue requirement impact of any differences between the actual and forecast net plant
23 and associated depreciation and amortization expense during the IR term for the PRP,
24 hydroelectric refurbishment and redevelopment projects, and other eligible projects, including
25 as a result of the availability of Clean Electricity Investment Tax Credits (“CEITCs”), will be
26 recorded in the Capacity Refurbishment Variance Account (“CRVA”). The revenue requirement
27 impact of any differences between the actual and forecast net plant and associated

² Operating as Gannett Fleming Canada ULC at the time of the EB-2013-0321 Depreciation Study.

³ EB-2020-0290 Ex. F4-1-1, Attachment 1.

⁴ EB-2013-0321 Ex. F5-3-1.

⁵ Interest capitalized to the PRP and DNNP expenditures prior to January 1, 2026, is included in the applicable in-service additions and rate base values.

1 depreciation and amortization expense for the DNNP, including as a result of the availability of
2 CEITCs, will be recorded, subject to O. Reg. 53/05, in the Darlington New Nuclear Project
3 Variance Account re Development (“DNNPVARD”). The CRVA is discussed in Ex. H1-1-1,
4 Section 5.6 and DNNPVARD in Ex. H1-1-1, Section 6.1.

5
6 Clean Electricity Investment Tax Credits are not assumed in OPG’s 2025-2031 Business Plan
7 or this Application, as discussed in Ex. F4-2-1, Section 3.6. To the extent they are available to
8 OPG’s regulated facilities or the DNNP facilities, the CEITCs will reduce the capital cost of
9 eligible projects and therefore in-service additions, rate base values and the associated
10 depreciation and amortization expense. To the extent the revenue requirement impact of these
11 changes is not captured in an existing deferral or variance account, the Application proposes
12 to record such impacts in newly established Clean Electricity ITC Variance Account (OPG) for
13 OPG’s facilities and Clean Electricity ITC Variance Account (DNNP) for the DNNP facilities.
14 These proposed accounts are discussed in Ex. H1-1-1.

15
16 Pursuant to the EB-2020-0290 Payment Amounts Order and similar provisions of prior
17 payment amounts orders, OPG has been required to file an accounting order application with
18 the OEB to address (i) a proposed accounting change impacting the nuclear liabilities other
19 than as a result of an ONFA Reference Plan update or (ii) a change in the EOL dates for its
20 prescribed nuclear facilities for depreciation and amortization purposes, in either case to the
21 extent the resulting revenue requirement impact for OPG’s prescribed facilities is \$10M or
22 greater on an annualized basis and is neither reflected in the current or proposed payment
23 amounts nor recorded in an deferral or variance account. The Application proposes to continue
24 this requirement for the IR term, subject to increasing the \$10M threshold to \$20M consistent
25 with the proposal to increase OPG’s overall materiality threshold from \$10M to \$20M, as
26 discussed in Ex. A1-3-2, Section 4.3.

1 The remainder of this evidence is organized as follows:

- 2 • Section 3.1 describes the depreciation and amortization policy and review process,
3 presents the current nuclear station EOL date assumptions and discusses the proposed
4 approach to the forecast depreciation expense for the PRP and the DNNP assets.
- 5 • Section 3.2 discusses the treatment of common assets through the use of asset service
6 fees.
- 7 • Section 3.3 presents the results of the 2024 Depreciation Study and the 2019 Hydroelectric
8 Depreciation Study.
- 9 • Sections 3.4 and 3.5 outline recent recommendations of OPG's Depreciation Review
10 Committee ("DRC") with respect to asset class lives and the change to the Pickering Units
11 5-8 EOL date effective December 31, 2023, respectively.
- 12 • Section 4.0 discusses the trends in depreciation and amortization expense for the
13 regulated nuclear facilities and the regulated hydroelectric facilities over the historical and
14 bridge years and the IR term.

15

16 **3.0 DEPRECIATION AND AMORTIZATION EXPENSE**

17 **3.1 Depreciation and Amortization Policy and Review Process**

18 The depreciation and amortization policy and treatment of asset retirements is unchanged from
19 EB-2020-0290 and prior payment amounts proceedings. Depreciation and amortization rates
20 for the various classes of the in-service fixed and intangible assets continue to be based on
21 their estimated service lives using the straight-line method. Any losses or gains on retirements
22 continue to be recognized at the time of the retirement.

23

24 For nuclear assets, the service life of an asset class continues to be limited by the service life
25 of the station(s) to which it relates. An average EOL date is established for depreciation
26 purposes for all units at a particular station, which is typically based on estimated EOL dates
27 for each operating unit of the station. The determination of the station EOL dates for
28 depreciation purposes involves an assessment of the condition and expected remaining life of
29 certain key components (referred to as life-limiting components), in conjunction with an
30 estimate of the expected operation of the station including the impacts of major refurbishment

1 activities and economic viability considerations. For the CANDU nuclear stations, life-limiting
2 components are fuel channels, steam generators, feeder pipes and reactor components.

3
4 For hydroelectric assets, the service lives of asset classes are not limited by an EOL date in
5 the same manner as nuclear facilities, as age does not generally establish an overall upper
6 limit on the expected useful life of a hydroelectric generating station. Regular maintenance and
7 the replacement of specific components typically allow hydroelectric stations to operate for
8 very long periods. The useful life of a hydroelectric facility therefore typically depends on the
9 condition of a population of its components and not a particular life-limiting component.⁶

10
11 The net book values of OPG's regulated nuclear facilities and the Bruce assets continue to
12 include asset retirement costs ("ARC") relating to OPG's asset retirement obligation ("ARO")
13 for nuclear decommissioning and nuclear waste management liabilities ("nuclear liabilities").
14 Accordingly, the depreciation and amortization expense for these stations includes the
15 depreciation of ARC, which forms part of the recovery methodologies for the underlying nuclear
16 liabilities, as discussed and presented in Ex. C2-1-1. As also discussed in Ex. C2-1-1, OPG
17 will be responsible for the nuclear liabilities arising for the DNNP facilities, with the depreciation
18 of the associated ARC during the IR term, once incurred, proposed to be recorded in a newly
19 established DNNP Nuclear Liability Deferral Account for future recovery in accordance with O.
20 Reg. 53/05 (Ex. H1-1-1, Section 7.0). Therefore, and for the reasons discussed in Ex. C2-1-1,
21 Section 8.0, there is no forecast depreciation expense for DNNP facilities' ARC included in the
22 proposed IR term nuclear revenue requirements.

23
24 The current EOL dates for depreciation purposes for OPG's regulated nuclear facilities and the
25 Bruce stations are provided in Chart 1 below and are reflected both in the proposed IR term
26 nuclear revenue requirements and OPG's financial statements. Chart 1 also presents such
27 EOL dates in effect at the time of EB-2020-0290.

⁶ Although dams can be considered a life-limiting component for hydroelectric facilities, in practice this does not result in an establishment of a specific end-of-life date for a station, as the dams are expected to be in use for the foreseeable future with regular maintenance. OPG uses an estimated service life of 100 years to depreciate dam structures.

1

Chart 1 - OPG Nuclear Station End-of-Life Dates

	EB-2020-0290 <i>Effective</i> <i>Dec. 31, 2017</i>	Current <i>Effective</i> <i>Dec. 31, 2023</i>
Darlington	December 31, 2052	December 31, 2052
Pickering Units 1 & 4	December 31, 2022	December 31, 2024
Pickering Units 5-8	December 31, 2024	December 31, 2070
Bruce A (Units 1-4)	December 31, 2052	December 31, 2052
Bruce B (Units 5-8)	December 31, 2061	December 31, 2061

2

3 OPG made two changes to the EOL dates since EB-2020-0290. First, based on the results of
 4 the feasibility assessment of refurbishing Pickering Units 5-8 and the Province of Ontario's
 5 ("Province") support for OPG's plan to proceed with the next steps toward the refurbishment,
 6 effective December 31, 2023, OPG extended the Pickering Units 5-8 EOL date from December
 7 31, 2024-December 31, 2070. Second, as detailed in EB-2020-0290 but not reflected in the
 8 resulting payment amounts due to the timing of preparing OPG's underlying business plan,
 9 OPG extended the EOL date for Pickering Units 1 and 4 from December 31, 2022-December
 10 31, 2024, effective December 31, 2020.⁷ As expected, Pickering Units 1 and 4 subsequently
 11 ended commercial operation in the fourth quarter of 2024, with the associated assets fully
 12 depreciated by the end of 2024. The above changes are discussed further in Section 3.5.

13

14 As reflected in OPG's 2025-2031 Business Plan and consistent with the approach previously
 15 accepted by the OEB for the forecast Darlington Refurbishment Program ("DRP") in-service
 16 additions,⁸ the forecast depreciation expense for the PRP in-service additions during the IR
 17 term has been calculated by assuming that the assets would be depreciated to the Pickering
 18 Units 5-8 station EOL of December 31, 2070, and for the DNNP in-service additions by
 19 assuming that the assets would be depreciated over the SMR's design life of 60 years. For the
 20 PRP, this assumption recognizes that a fundamental purpose of the program is to replace life
 21 limiting components that would enable the units to operate to the end of the post refurbishment
 22 life. For the DNNP, this assumption represents OPG's best available information at the time of
 23 Application filing. A detailed asset class review of the in-service additions and associated

⁷ EB-2020-0290: Ex. L-F4-01-Staff-269, Attachment 1, p. 4; Ex. L-F4-01-Staff-271.

⁸ For example, see EB-2016-0152, Ex. L-6.9-1 Staff-180.

1 service lives will be completed for the PRP as or shortly after the first unit, Unit 5, is placed in
2 service and for the DNNP as or shortly after Unit 1 is placed in service, and will be subject to
3 OPG's DRC process, described below, and future independent assessments of asset service
4 life estimates. An EOL date assumption for the DNNP facilities is also expected to be
5 assessed, as applicable. Any resulting differences between the forecast depreciation expense
6 for the PRP and DNNP assets reflected in the approved revenue requirements and such actual
7 expense during the IR term will be recorded in the CRVA (for the PRP) and the DNNPVARD
8 (for the DNNP). The PRP is discussed further in Ex. D2-3-1 through Ex. D2-3-10 and the DNNP
9 in Ex. D2-4-1 through Ex. D2-4-10.

10
11 In EB-2013-0321, the OEB accepted the results of the 2013 Depreciation Study, predicated
12 on OPG's continued application of the average life group method.⁹ As in EB-2016-0152 and
13 EB-2020-0290, OPG continues to apply the average life group method for the purposes of
14 calculating depreciation expense for both regulated nuclear and regulated hydroelectric
15 assets, which continues to be recommended by Concentric in finding, as part of the 2019
16 Hydroelectric Depreciation Study, the 2020 Nuclear Depreciation Study and the 2024
17 Depreciation Study, that this approach "results in a reasonable recovery of OPG's capital
18 investment over time".¹⁰

19
20 As part of its due diligence process over financial reporting, OPG continues to convene an
21 internal DRC to examine the service lives of fixed and intangible assets and therefore the
22 calculation of depreciation and amortization expense. The DRC is comprised of business
23 representatives as well as staff from the Finance and Regulatory Affairs functions, and
24 engages, as necessary, with specialized technical experts across the organization. The DRC
25 considers available engineering, technical, operational and financial assessments/information
26 as part of its regular review of the service lives of nuclear generating stations (including the
27 Bruce stations) and a selection of asset classes with the general objective of reviewing all
28 significant asset classes for the nuclear and regulated hydroelectric assets over a five-year

⁹ OEB Decision with Reasons, EB-2013-0321, November 20, 2014, p. 98.

¹⁰ Attachment 12, p. 3-1; Attachment 1, p. 3-1; Attachment 7, p. 3-1; EB-2020-0290, Ex. F4-1-1, Attachment 1, p. 3-1.

1 cycle. Periodic independent reviews of the service life estimates for the regulated assets are
2 also performed, as recommended by Concentric.¹¹

3
4 The DRC's scope and recommendations continue to be submitted for approval to OPG's senior
5 executives, including the Chief Financial Officer and Chief Administrative Officer, the Chief
6 Commercial Officer and the business leaders of Nuclear and Hydroelectric operations (the
7 "Approvals Committee"). Approved DRC recommendations are used to calculate the
8 depreciation and amortization expense that is reflected in OPG's financial statements and
9 business plan. Any changes to asset service lives resulting from the DRC process are typically
10 implemented prospectively as of the end of the review year or the beginning of the following
11 year. As part of the 2013 Depreciation Study, the 2019 Hydroelectric Depreciation Study and
12 the 2020 Nuclear Depreciation Study, Concentric found OPG's DRC review process to be
13 procedurally sound and reasonable.¹² In the 2024 Depreciation Study, Concentric again found
14 the process "to be procedurally sound, reasonable and resulting in valid depreciation rates and
15 generating station lives".¹³

16
17 The DRC recommendations are discussed in Section 3.4.

18 19 **3.2 Treatment of Common Assets**

20 Virtually all of OPG's in-service fixed and intangible assets continue to be exclusively or near
21 exclusively associated with specific generation facilities or groups of hydroelectric generation
22 facilities. As in prior OPG proceedings, OPG's fixed and intangible assets used by multiple
23 generating businesses such as certain information technology assets, or those within a
24 generating business used by both regulated and unregulated operations such as joint-use
25 Renewable Generation assets, are not included in the rate base or the associated depreciation
26 and amortization expense component of the revenue requirement. Instead, the corresponding
27 generating businesses, now including the DNNP facilities, are charged an asset service fee
28 for the use of these assets, where applicable. Similarly, OPG's fixed and intangible assets to
29 be used exclusively or near exclusively for the DNNP facilities are not included in OPG or

¹¹ Attachment 1, p. 1-4; Attachment 7, p. 1-3, Attachment 12, pp. 1-3.

¹² EB-2013-0321 Ex. F5-3-1; Attachment 12, pp. 1-2; EB-2020-0290 Ex. F4-1-1, Attachment 1, pp. 1-3.

¹³ Attachment 1, p. 1-3; Attachment 7, pp. 1-2.

1 DNNP LP's rate base or associated depreciation and amortization expense component of the
2 revenue requirement. Instead, the DNNP facilities will be charged a corresponding asset
3 service fee once the facilities have been transferred to DNNP LP. Asset services fees are
4 charged as an OM&A cost and are discussed further in Ex. F3-2-1.

6 **3.3 Independent Depreciation Studies**

7 As discussed above, OPG engaged Concentric in 2024 to conduct an independent
8 assessment of depreciation rates and generating station lives for OPG's regulated nuclear and
9 regulated hydroelectric facilities based on the net book values of in-service assets as at
10 December 31, 2024, including the assets placed in service upon the return to service from
11 refurbishment of Darlington Unit 3 in 2023 and Darlington Unit 1 in 2024. The results of the
12 assessment are summarized in Section 3.2.1 below.

13
14 Since EB-2013-0321, OPG also engaged Concentric in 2019 to conduct an independent
15 review and assessment of depreciation rates for OPG's regulated hydroelectric facilities based
16 on the net book values of in-service assets at December 31, 2019. The results of the
17 assessment are summarized in Section 3.2.2 below.

19 **3.3.1 2024 Depreciation Study Results**

20 The results of the 2024 Depreciation Study are summarized as follows:

21
22 In reviewing depreciation rates for OPG's nuclear plant accounts, Concentric
23 supports the average service lives currently in use, subject to recommended
24 changes for the following accounts:

- 25 • Nuclear – Security and Other Fencing – Pickering and Darlington: from 20
26 years to 15 years; and
- 27 • Nuclear – Exciters – Pickering and Darlington: from 30 years to 35 years.¹⁴

¹⁴ Attachment 1, pp. 1-4.

1 In reviewing depreciation rates for OPG's hydroelectric plant accounts,
2 Concentric supports the average service lives currently in use, subject to
3 recommended changes for the following accounts:

- 4 • Hydroelectric – Gates, Stoplogs and Operating Mechanisms: from 50 years
5 to 45 years;
- 6 • Hydroelectric – Station Service Electrical Equipment: from 45 years to 40
7 years; and
- 8 • Hydroelectric – Electronic Security Systems: from 10 years to 20 years.¹⁵

9
10 In reviewing depreciation rates for OPG's other plant accounts, Concentric
11 supports the average service lives currently in use, subject to recommended
12 changes for the following accounts:

- 13 • Administrative and Service Buildings – Administrative Telecom Equipment:
14 from 7 years to 10 years.¹⁶

15
16 Concentric also believes that the life span dates currently in place for
17 depreciation purposes for the regulated nuclear generating assets are
18 reasonable for use in this study, recognizing that OPG is in the midst of
19 completing the refurbishment project at Darlington NGS and preparing for the
20 refurbishment of Pickering NGS (Units 5-8) to commence in 2027.¹⁷

21
22 OPG has informed Concentric that the SMR has a design life of 60 years after
23 the start of commercial operation. As such, Concentric deems it reasonable to
24 depreciate these assets over a useful life of 60 years in the time between the
25 completion of the SMR and the conducting of a more detailed componentization
26 and depreciation analysis of the assets as part of the next depreciation study,
27 a period anticipated to be within 1 – 2 years.¹⁸

¹⁵ Attachment 7, pp. 1-3.

¹⁶ Attachment 1, pp. 1-4; Attachment 7, pp. 1-3.

¹⁷ Attachment 1, pp. 1-4.

¹⁸ Attachment 1, pp. 3-6.

1 OPG has accepted and, effective January 1, 2026, will implement the above asset class
2 recommendations from the study pending formal approval through the 2025 DRC process.
3 OPG's forecast depreciation and amortization expense in this Application incorporates the
4 estimated impact of these changes effective January 1, 2026, which is an increase of
5 approximately \$2.5M annually for the regulated hydroelectric assets and less than \$1M
6 annually for OPG's nuclear assets.

8 3.3.2 2019 Hydroelectric Depreciation Study Results

9 The results of the 2019 Hydroelectric Depreciation Study are summarized as follows:

10
11 In reviewing depreciation rates for OPG's hydroelectric plant accounts,
12 Concentric supports the average service lives currently in use, subject to
13 recommended changes for the following three accounts:

- 14 • Hydroelectric – Outdoor Structures: from 75 to 70 years;
- 15 • Hydroelectric – Bus, Switching and Power Cables: from 45 to 50 years; and
- 16 • Hydroelectric – Station Service Electrical Equipment: from 50 years to 45
17 years.¹⁹

18
19 OPG accepted and, effective January 1, 2020, implemented the above recommendations from
20 the study. These changes had an estimated impact of increasing OPG's depreciation and
21 amortization expense starting in 2020 by less than \$1M annually for the regulated hydroelectric
22 assets, which is reflected in this Application.

24 **3.4 Depreciation Review Committee Recommendations**

25 OPG accepted and, effective January 1, 2021, implemented the recommendations from the
26 2020 Nuclear Depreciation Study upon formal approval through the 2020 DRC process.²⁰
27 Since then, the DRC was convened four times, annually over the 2021-2024 period, with
28 changes to asset class lives recommended and approved for the regulated nuclear assets as

¹⁹ Attachment 12, pp. 3-7.

²⁰ The results of the 2020 DRC process for the nuclear facilities were provided in EB-2020-0290, Ex. L-F4-01-Staff-269 and, with respect to the review of asset class lives, were reflected in the EB-2020-0290 Payment Amounts Order (Appendix A, Table 10a, Note 1).

1 summarized below, in addition to the extension of the Pickering Units 5-8 EOL date discussed
2 in Section 3.4. As anticipated in EB-2020-0290, this included the results of the DRC’s review,
3 over the 2021-2023 period, to confirm the appropriateness of any remaining service lives for
4 significant existing assets or projects tied to Darlington (i.e., other than those comprising the
5 DRP in-service additions) that were shorter than the overall 30-year post-refurbishment life
6 assumption for the units.²¹ The following asset class life changes were implemented for the
7 regulated nuclear assets through the DRC process since 2020:

- 8 • In 2021, the DRC recommended establishing a separate asset class for certain heat
9 exchanger assets at Darlington with an average service life of 40 years, compared to the
10 current 30 year average service life, to align with the station’s post refurbishment life;
- 11 • In 2021, the DRC recommended establishing a separate asset class for certain service
12 water and fire protection system assets at Darlington with an average service life of 40
13 years, compared to the existing 25 year average service life, to align with the station’s post
14 refurbishment life;
- 15 • In 2021, the DRC recommended an increase in the average service life for the Darlington
16 new fuel load half charge asset class from 25 years to 30 years to align with the station’s
17 post refurbishment life;
- 18 • In 2022, the DRC recommended establishing a separate asset class for certain
19 instrumentation and control assets at Darlington with an average service life of 55 years,
20 compared to the existing 15 year average service life, to align with the station’s post
21 refurbishment life;
- 22 • In 2022, the DRC recommended establishing a separate asset class for certain service
23 water and fire protection system assets at Darlington with an average service life of 55
24 years, compared to the existing 25 year average service life, to align with the station’s post-
25 refurbishment life;
- 26 • In 2023, the DRC recommended a reduction in the service life for the Darlington Vehicle
27 Screening Facility assets from 50 years to 15 years;

²¹ EB-2020-0290: Ex. L-F4-01-SEC-138 and Ex. L-F4-01-Staff-269, Attachment 1, p. 6.

- 1 • In 2023, the DRC recommended establishing a separate asset class for certain heat
2 exchanger assets at Darlington with an average service life of 55 years compared to the
3 existing 30 year average service life, to align with the station's post refurbishment life; and
- 4 • In 2023, the DRC recommended establishing a separate asset class for certain common
5 service system assets at Darlington with an average service life of 55 years, compared to
6 the existing 35 year average service life, to align with the station's post refurbishment life.

7
8 The above changes had an aggregate estimated impact of decreasing OPG's nuclear
9 depreciation and amortization expense by approximately \$6M annually and are reflected in
10 this Application. The changes were reflected in the asset service life estimates reviewed by
11 Concentric as part of the 2024 Depreciation Study, which did not recommend any further
12 changes to these asset classes.

13
14 Subsequent to the implementation of the recommendations from the 2019 Hydroelectric
15 Depreciation Study effective January 1, 2020, the DRC process has not resulted in any
16 changes to asset class lives for the regulated hydroelectric facilities.

17
18 The DRC recommendations for years 2020 to 2024 are provided in Attachments 2-6 for the
19 regulated nuclear facilities. The DRC recommendations for years 2021-2024 are provided in
20 Attachments 8-11 for the regulated hydroelectric facilities. There were no separate DRC
21 recommendations produced for the regulated hydroelectric facilities for 2020.

22 23 **3.5 Changes in Nuclear Station End-Of-Life Dates since EB-2020-2090**

24 **3.5.1 Extension of Pickering Units 1 and 4 End-of-Life Date to 2024**

25 As detailed in EB-2020-0290, in 2020, the DRC concluded that OPG had achieved sufficient
26 high confidence, for accounting purposes, to extend the EOL date for Pickering Units 1 and 4
27 to December 31, 2024. Previously and in the determination of the EB-2020-0290 nuclear
28 payment amounts, the EOL date was set at December 31, 2022. The DRC made this
29 conclusion on the basis of the high technical confidence associated with the programs and
30 provisions in place to assure fitness-for-service of major components, including certain steam
31 generators at Pickering Unit 4. This EOL date was adopted for accounting purposes effective

1 December 31, 2020. In connection with these changes, OPG recorded an adjustment to the
2 ARO/ARC balances as of December 31, 2020, in accordance with US GAAP, as discussed in
3 Ex. C2-1-1.

4

5 In accordance with the EB-2020-0290 Payment Amounts Order, the nuclear liabilities' revenue
6 requirement impact for the prescribed facilities resulting from the above revision to the EOL
7 date for Pickering Units 1 and 4 was recorded in the Impact Resulting from Optimization of
8 Pickering Station End-of-Life Dates Deferral Account in 2021 and, upon approval of the 2022
9 ONFA Reference Plan that incorporated this revised EOL date, is being recorded in the
10 Nuclear Liability Deferral Account since 2022. The prescribed facilities' revenue requirement
11 impact arising from the resulting changes in the non-ARC depreciation and amortization
12 expense is being recorded in the Impact Resulting from Optimization of Pickering Station End-
13 of-Life Dates Deferral Account since 2021.²² These impacts will continue to be recorded in the
14 deferral accounts until the effective date of the next payment amounts order incorporating the
15 changes in the nuclear payment amounts. The above deferral accounts are discussed in Ex.
16 H1-1-1, Sections 5.14 and 5.23.

17

18 As Pickering Units 1 and 4 ended commercial operation and became fully depreciated by the
19 end of 2024, the change in their EOL date from December 31, 2022 to December 31, 2024 did
20 not result in an overall change in the non-ARC depreciation and amortization expense over the
21 2021 to 2026 period.²³ It resulted in an increase of approximately \$55M in ARC depreciation
22 expense for the prescribed facilities over the 2021-2026 period, reflecting the year-end 2020
23 ARO/ARC adjustment.²⁴

²² The year-end 2022 balances in these accounts were approved for recovery through the OEB-approved settlement proposal in EB-2023-0336.

²³ Ex. H1-1-1, Table 18, line 5 and EB-2023-0336, Ex. H1-1-1, Table 19, line 5 show a total change in non-ARC depreciation and amortization expense of \$16.3M, rather than zero, over the 2021-2024 period in relation to these EOL date changes for Pickering Units 1 and 4. As discussed in Ex. H1-1-1, Section 5.23, this amount, which is being recorded in the Impact Resulting from Optimization of Pickering Station End-of-Life Dates Deferral Account, is determined by applying the revised Pickering Units 1 and 4 EOL dates to recalculate the corresponding OEB-approved values reflected in the EB-2016-0152 revenue requirement (for 2021) and EB-2020-0290 revenue requirement (for 2022-2024), holding other variables consistent with the respective revenue requirement. This approach allows for isolation of the EOL date change impact had it been known at the time of setting the original revenue requirement. Because, as a result, the impacts are calculated on a different set of underpinning forecasts (e.g., capital in-service additions) for 2021 versus 2022-2024, the net effect of the differences in non-ARC depreciation across these account entries over these four years may not be zero.

²⁴ Sum of Ex. H1-1-1, Table 18, line 4 and EB-2023-0336, Ex. H1-1-1, Table 19, line 4.

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3.5.2 Extension of Pickering Units 5-8 End-of-Life Date to 2070

The 2023 DRC review concluded that OPG had achieved sufficient high confidence, for accounting purposes, in the planned refurbishment of Pickering Units 5-8 and recommended a corresponding extension to their EOL date to December 31, 2070.²⁵ The DRC made this conclusion taking into account, among others, the results of the refurbishment feasibility assessment approved by OPG’s Board of Directors in August 2023, the Province’s announced support for OPG to proceed with next steps toward refurbishing these units in January 2024, the significant role that Pickering can have in meeting Ontario’s future energy needs, previous experience with the refurbishment of the Darlington units, and the processes and programs in place to support the necessary CNSC licensing requirements. This EOL date was adopted for accounting purposes effective December 31, 2023. In connection with these changes, OPG recorded an adjustment to the ARO/ARC balances as of December 31, 2023, in accordance with US GAAP, as discussed in Ex. C2-1-1. As discussed in Ex. D2-3-1, OPG then continued to advance the Pickering Refurbishment Program through decision gates leading up to the OPG’s Board of Directors approval to proceed into the execution phase from in November 2025, with the Province’s support announced shortly after. Consistent with OPG’s 2025-2031 Business Plan and aligned to the overall operating assumptions underpinning the Application, the proposed IR term nuclear revenue requirements reflect the December 31, 2070, EOL date for Pickering Units 5-8.

In recommending an extension to the EOL date for Pickering Units 5-8, the 2023 DRC review made a distinction between those assets currently comprising the units that, based on a preliminary review, would be expected to be replaced through the refurbishment and those that would be expected to support post-refurbishment operations. The DRC recommended a post-refurbishment EOL date of December 31, 2070, for the latter category of assets and a pre-refurbishment EOL date of September 30, 2026, when the four units are scheduled to come offline before the refurbishment, for the former category of assets.

²⁵ Attachment 3, p. 3.

1 In accordance with the EB-2020-0290 Payment Amounts Order, the nuclear liabilities' revenue
2 requirement impact for the prescribed facilities and the revenue requirement impact arising
3 from the changes in the non-ARC depreciation and amortization expense for the prescribed
4 facilities as a result of the above revision to the EOL date for Pickering Units 5-8 is being
5 recorded in the Impact Resulting from Optimization of Pickering Station End-of-Life Dates
6 Deferral Account since 2024 and until the effective date of the next payment amounts order
7 incorporating the changes in the nuclear payment amounts. The deferral account is discussed
8 in Ex. H1-1-1, Section 5.23.

9
10 As set out in Ex. H1-1-1, the change in the Pickering Units 5-8 EOL date results in a total
11 decrease of approximately \$48M in the non-ARC depreciation and amortization expense over
12 the 2024-2026 period based on forecast asset values reflected in the EB-2020-0290 nuclear
13 payment amounts, which impact is being recorded in the Optimization Pickering Station End-
14 of-Life Dates Deferral Account.²⁶ These impacts are partially offset by a total increase of
15 approximately \$92M in ARC depreciation expense for the prescribed facilities over the 2024-
16 2026 period as a result of the above changes, inclusive of the associated year-end 2023
17 ARO/ARC adjustment, as also being recorded in the account.²⁷

18 19 **4.0 DEPRECIATION AND AMORTIZATION EXPENSE TRENDS**

20 **4.1 OPG's Hydroelectric Depreciation and Amortization Expense Trends**

21 The depreciation and amortization expense for OPG's regulated hydroelectric facilities is
22 presented in Ex. F4-1-1, Table 1 for the 2016-2031 period. The overall depreciation expense
23 and amortization was largely stable from 2016 to 2021, averaging \$146.7M annually. It
24 increases from \$153.4M in 2021 to \$271.7M in 2031 largely due to the impact of in-service
25 additions across the fleet. The capital work program for OPG's regulated hydroelectric fleet is
26 discussed in Ex. D1-1-1.

²⁶ Ex. H1-1-1, Table 19, line 5.

²⁷ Ex. H1-1-1, Table 19, line 4.

1 **4.2 OPG's Nuclear Depreciation and Amortization Trends**

2 The depreciation and amortization expense for OPG's nuclear facilities is presented in Ex. F4-
3 1-1, Table 2 for the 2020-2031 period. The overall depreciation and amortization expense
4 increases from \$448.6M in 2020 to \$992.6M in 2031 largely due to the impact of the in-service
5 additions for the DRP, the PRP and the non-DRP capital projects for Darlington. This is partially
6 offset by a decrease in depreciation and amortization expense for Pickering due to the end of
7 commercial operation of Pickering Units 1 and 4 in 2024 and the extension of the EOL date for
8 Pickering Units 5-8 to 2070 to reflect their planned refurbishment.

9
10 The increase in depreciation and amortization expense in 2021 was mainly due to the first full
11 year of depreciation for the in-service addition related to the return to service of refurbished
12 Darlington Unit 2 in 2020. The subsequent increase in in 2022 was mainly due to the increase
13 in the ARC recorded as of December 31, 2021, to reflect the approved 2022 ONFA Reference
14 Plan, as discussed in Ex. C2-1-1. The further increase in 2023 was mainly due to the in-service
15 additions related to the return to service of refurbished Darlington Unit 3 during the year. The
16 additional increase in 2024 was mainly due to the first full year of depreciation for the in-service
17 additions related to the return to service of refurbished Darlington Unit 3 in 2023 and the return
18 to service of refurbished Darlington Unit 1 during the year. The lower depreciation in 2024 due
19 to the extension of the EOL date for Pickering Units 5-8 to 2070 was largely offset by the impact
20 of the increase in the ARC recorded as of December 31, 2023 to reflect this extension.

21
22 The decrease in depreciation and amortization expense in 2025 mainly reflects Pickering Units
23 1 and 4 being fully depreciated by the end of 2024. The subsequent increases over the 2026-
24 2031 period reflect forecasted capital assets being placed in service for several major
25 equipment replacements and rehabilitations at Darlington and in connection with the resumed
26 sustaining capital work at Pickering in support of post-refurbishment operation of Units 5-8, in
27 addition to the expected return to service of refurbished Pickering Unit 5 in May 2031.

28
29 The DRP is discussed in Ex. D2-2-1. Darlington's sustaining capital work program is discussed
30 in Ex. D2-1-2.

1 **4.3 DNNP Facilities Depreciation and Amortization Trends**

2 The depreciation and amortization expense for the DNNP facilities is presented in Ex. F4-1-1,
3 Table 2 for the 2020-2031 period. Depreciation and amortization expenses for the DNNP
4 facilities will commence upon Unit 1 entering commercial operation, expected in October 2030.
5 The increase in depreciation and amortization expense from \$22.6M in 2030 to \$109.7M in
6 2031 reflects the first full year of depreciation for the forecasted in-service additions in 2030.

LIST OF ATTACHMENTS

- 1
- 2
- 3 Attachment 1: Concentric Report: Assessment of Regulated Nuclear Asset Depreciation
- 4 Rates and Generating Station Lives – December 2025
- 5
- 6 Attachment 2: 2024 Depreciation Review Committee Recommendations for Nuclear
- 7
- 8 Attachment 3: 2023 Depreciation Review Committee Recommendations for Nuclear
- 9
- 10 Attachment 4: 2022 Depreciation Review Committee Recommendations for Nuclear
- 11
- 12 Attachment 5: 2021 Depreciation Review Committee Recommendations for Nuclear
- 13
- 14 Attachment 6: 2020 Depreciation Review Committee Recommendations for Nuclear
- 15
- 16 Attachment 7: Concentric Report: Assessment of Regulated Hydroelectric Asset
- 17 Depreciation Rates – November 2025
- 18
- 19 Attachment 8: 2024 Depreciation Review Committee Recommendations for Regulated
- 20 Hydroelectric Generation
- 21
- 22 Attachment 9: 2023 Depreciation Review Committee Recommendations for Regulated
- 23 Hydroelectric Generation
- 24
- 25 Attachment 10: 2022 Depreciation Review Committee Recommendations for Regulated
- 26 Hydroelectric Generation
- 27
- 28 Attachment 11: 2021 Depreciation Review Committee Recommendations for Regulated
- 29 Hydroelectric Generation

- 1 Attachment 12: Concentric Report: 2019 Assessment of Regulated Asset Depreciation
- 2 Rates and Generating Station Lives – December 2019



ASSESSMENT OF REGULATED NUCLEAR ASSET DEPRECIATION RATES AND GENERATING STATION LIVES

December 2025

Prepared for Ontario Power Generation

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December 14, 2025

Ontario Power Generation
700 University Avenue
Toronto, ON M5G 1X6

Attention: Herman Mo
Senior Manager, Regulatory Affairs

Dear Mr. Mo;

Pursuant to your request, we conducted a review and assessment of the regulated life estimates related to the Ontario Power Generation nuclear generation assets as of December 31, 2024. Our report presents a description of review undertaken by Concentric as well as our recommendations for a small number of revisions to the average service life estimates. Concentric completed a similar study of the hydroelectric generation assets as of December 31, 2024.

We gratefully acknowledge the assistance of Ontario Power Generation personnel in the completion of the review.

Should you have any questions or concerns, please do not hesitate to contact me directly at 587.997.6489

Yours truly,

Concentric Advisors, ULC

A handwritten signature in cursive script that reads "Amanda Nori". The signature is written in black ink on a light-colored background.

Amanda Nori
Assistant Vice President

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SECTION 1

1 BASIS OF STUDY

1.1 Introduction and Scope

Concentric Advisors, ULC (“Concentric” or “Concentric Advisors”) has been retained by Ontario Power Generation (“OPG”) to review the average service life estimates of its regulated nuclear generation assets based on December 31, 2024 asset values. This report sets forth in the findings of our independent review.

The average service life estimates recommended in this report are considered in OPG’s depreciation review process in establishing the asset depreciation rates and generating station lives for the Property, Plant and Equipment (“PP&E”) of OPG’s prescribed facilities, including directly assigned corporate PP&E balances. As the depreciation and amortization expense for regulated revenue requirement purposes includes intangible assets, average service lives for intangible assets were also included in this analysis.

The facilities for which average service lives were analyzed consist of two nuclear generation facilities, the Darlington NGS and the Pickering NGS, together with the associated other plant assets. As part of this study, Concentric Advisors reviewed the operating considerations and typical station configurations of these nuclear generation facilities. This included site tours, a review of notes from site tours taken in prior studies, and detailed operational staff discussions. As further discussed in section 3.2.7, a significant amount of capital additions has been placed in service upon returning to service from refurbishment three out of the four units at Darlington NGS over the last several years, with the fourth unit anticipated to be completed in 2026. OPG has also recently received approval to proceed with the refurbishment of the four currently operating units at Pickering NGS, anticipated to be completed in 2034.

1.2 Background

In March 2007, Concentric Advisors (then operating as Gannett Fleming) submitted a report titled “Review of the Ontario Power Generation Inc. Depreciation Review Process” (the “2007 Report”). The 2007 Report presented a summary of the findings of an independent review of the processes, procedures and methods used by OPG to review its depreciation expense. The 2007 Report indicated that “Gannett Fleming has found that the processes, procedures and methods followed by Ontario Power Generation Inc. adequately meet regulatory objectives regarding depreciation generally accepted by Canadian regulatory authorities.”¹ Additionally, Gannett Fleming found that “OPG’s current Depreciation Review Process results in the depreciation expense component of the revenue requirement that reasonably and appropriately reflects the consumption of the average service life of OPG’s regulated assets. Gannett Fleming also views that, overall, the Depreciation Review Committee (“DRC”) process is adequate in meeting the generally accepted regulatory objectives regarding depreciation for regulated North American utilities.”² Overall, the 2007 Report concluded that the procedural foundation upon which OPG’s DRC had developed average service life estimates

¹ Cover letter to the 2007 Report

² 2007 Report, page III-2.

was robust and appropriate. The 2007 Report contributed, in part, to the Ontario Energy Board's ("OEB") acceptance of OPG's depreciation expense in the EB-2010-0008 proceeding

Subsequently, Gannett Fleming was retained by OPG to complete independent comprehensive assessments of depreciation rates and generating station lives of OPG's prescribed hydroelectric and nuclear assets based on December 31, 2010, December 31, 2012 (and for the Niagara Tunnel placed in service in 2013), December 31, 2018 (prescribed hydroelectric only) and December 31, 2019 (prescribed nuclear only) asset values. The first two assessments were documented by Gannett Fleming in reports titled "Assessment of Regulated Asset Depreciation Rates and Generating Station Lives" dated December 16, 2011 ("2011 Report") and November 29, 2013 ("2013 Report"). The work completed in 2019 and in 2020 was documented by Concentric Advisors in reports titled and "Assessment of Regulated Hydroelectric Asset Depreciation Rates" dated December 2019 ("2019 Hydroelectric Report") and "Assessment of Regulated Nuclear Asset Depreciation Rates and Generating Station Lives" dated December 2020 ("2020 Nuclear Report").

The 2011 Report and 2013 Report found that "the currently approved average service life estimates continued to be based on a procedurally sound and reasonable DRC process" and that "to a large extent, the work prepared over the past several years by the DRC [continued] to be a reliable information source."³ The 2019 Hydroelectric Report and the 2020 Nuclear Report similarly found the DRC process "to be procedurally sound, reasonable and resulting in valid depreciation rates and generating station lives that accurately reflect the consumption of average service life of OPG's regulated assets" and that "the work prepared by the DRC continues to be an overall reliable source of information in conducting the 2020 Depreciation Rate Assessment."⁴ Concentric also noted that OPG had continued to calculate depreciation rates using the Straight-Line method for virtually all plant comprising regulated assets, based on the Average Life Group Procedure – Whole Life Technique, found that this "results in a reasonable recovery of OPG's capital investment over time" and recommended their continued application.⁵

As part of these previous reports, Gannett Fleming and Concentric reviewed the average service life estimates for each depreciable group and the generating station lives based on their professional judgement, taking into consideration the results of the DRC process, the company's practices and outlook as they relate to plant operation, asset condition and retirement, the service life estimates of peer electric generation companies (as applicable), and the experience of Gannett Fleming and Concentric in selecting average service lives for similar plant. In adopting this approach to their assessment, it was noted that "[i]n the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed actuarial study of retirement history" and "[a]s such, a retirement rate analysis was not completed by Concentric Advisors."⁶

Each of the previous reports recommended a small number of revisions to the average service life estimates for OPG's regulated assets, which were adopted in full by OPG. Previous reports also

³ 2013 Report, page I-7

⁴ 2020 Nuclear Report, page 1-3 and similarly 2019 Hydroelectric Report, page 1-2

⁵ 2020 Nuclear Report, page 3-1 and similarly 2019 Hydroelectric Report, page 3-1

⁶ 2020 Nuclear Report, page 3-4 and similarly 2019 Hydroelectric Report, page 3-5

concluded that “the use of life span dates is appropriate for the OPG nuclear generation plants” and “that the factors considered and methods used by the DRC in the assessment of life span dates remain appropriate and consistent with common regulatory practices and should continue to be used in future reviews.”⁷

Previous reports also recommended that each “account should be subjected to a complete depreciation study which re-evaluates its average service life estimates periodically”⁸, noting “that OPG’s practice of reviewing significant asset accounts and depreciation service lives over an approximate five-year cycle under the DRC process continues to meet the recommended practice of continued surveillance to maintain the use of appropriate depreciation rates, when supplemented by a periodic comprehensive independent assessment.”⁹

The 2020 Nuclear Report also found that the “process used by OPG to componentize the capital amount placed in service upon completion of refurbishment of Unit 2 of Darlington NGS in June 2020 to result in reasonable and valid depreciation rates going forward.”¹⁰

The 2011 Report and 2013 Report were filed with the OEB in OPG’s 2014-2015 payment amounts proceeding, EB-2013-0321, in satisfaction of the OEB’s direction regarding an independent depreciation study. In its EB-2013-0321 decision, the OEB accepted the results of the 2011 Report as updated by the 2013 Report for both nuclear and hydroelectric assets, including OPG’s continued use of the average life group method to determine depreciation expense, and approved the depreciation expense as filed for inclusion in OPG’s payment amounts.¹¹

In line with the recommended cycle of approximately five years for a periodic depreciation study, no independent depreciation assessment was filed by OPG in EB-2016-0152. The 2020 Nuclear Report was filed with the OEB in OPG’s 2022-2026 payment amounts proceeding, EB-2020-0290. In its EB-2020-0290 decision, the OEB approved a settlement proposal by OPG and intervening parties that, among other issues, accepted OPG’s proposed depreciation service lives.¹² OPG’s hydroelectric base payment amount was not rebased in that proceeding and the 2019 Hydroelectric Report was not filed with the OEB at the time.

1.3 Summary of Results

Concentric has reviewed the DRC process and again finds it to be procedurally sound, reasonable and resulting in valid depreciation rates and generating station lives that accurately reflect the consumption of average service life of OPG's regulated assets. Overall, Concentric finds that the work prepared by the DRC continues to be an overall reliable source of information in conducting this 2024 Depreciation Rates Assessment.

Concentric also finds that OPG's practice of reviewing significant asset accounts and depreciation service lives over an approximate five-year cycle under the DRC process continues to meet the

⁷ 2020 Nuclear Report, page 3-6

⁸ 2013 Report, page II-11

⁹ 2020 Nuclear Report, page 1-3 and similarly 2019 Hydroelectric Report, page 1-3

¹⁰ 2020 Nuclear Report, page 1-4

¹¹ EB-2013-0321 Decision with Reasons, November 20, 2014, page 98

¹² EB-2020-0290 Decision and Order, November 15, 2021, Schedule A, page 44

recommended practice of continued surveillance to maintain the use of appropriate depreciation rates, when supplemented by a periodic comprehensive independent assessment.

Further, Concentric finds OPG's continued use of the Straight-Line Method and the Average Life Group Procedure – Whole Life Technique to determine depreciation expense to be reasonable, and its use of, and approach to determining life span dates for the Darlington NGS and Pickering NGS are valid.

In reviewing depreciation rates for OPG's nuclear plant accounts, Concentric supports the average service lives currently in use, subject to recommended changes for the following accounts:

- Nuclear – Security and Other Fencing: from 20 years to 15 years; and
- Nuclear – Exciters: from 30 years to 35 years.

In reviewing depreciation rates for OPG's other plant accounts associated with the nuclear generating facilities, Concentric supports the average service lives currently in use, subject to recommended changes for the following accounts:

- Administrative and Service Buildings – Administrative Telecom Equipment: from 7 years to 10 years.

Concentric also believes that the life span dates currently in place for depreciation purposes for the regulated nuclear generating assets are reasonable for use in this study, recognizing that OPG is in the midst of completing the refurbishment project at Darlington NGS and preparing for the refurbishment of Pickering NGS (Units 5-8) to commence in 2027.

SECTION 2

2 PLAN OF STUDY

This study is presented in the following order:

Section 1:	Presents the Scope of the Study and provides background of prior study conclusions with a brief summary of the depreciation study results
Section 2:	Contains statements with respect to the plan and the basis of the study
Section 3:	Discusses development of average service life estimates, and presents descriptions of the methods used and factors considered in the service life study
Section 4:	Presents study results by depreciable group in Table 1

2.1 Information Provided by OPG

OPG has provided Concentric with required information, as of December 31, 2024, for all accounts being studied. This information has been compiled from the plant accounting records and includes the following:

- current balances by vintage year for each account (aged balances). The balances provide the amount of investment sorted by installation year currently in operation. This file is only inclusive of current plant in service and does not include any retirement information;
- Retirement transactions where available through December 31, 2024. The transactions include information regarding the transaction year of the retirement and the original cost of the asset being retired; and
- copies of the most recent DRC reviews for all regulated nuclear plant asset accounts.

2.2 Procedures Performed

The above data was reviewed and reconciled to Company control schedules to ensure accuracy and reasonableness. These checks include that the surviving investment by account equals (or can be reconciled to) the Company's gross plant in service and accumulated depreciation ledger balances.

In addition, Concentric performed the following procedures to form the basis of the results of this study:

- confirm accounting policies being followed in accordance with US generally accepted accounting principles ("US GAAP");
- conduct interviews with OPG personnel to obtain and confirm understanding of nuclear plant operations;
- review of DRC recommendations and supporting documentation; and
- review of prior working papers and supporting documents from the 2011 Report, 2013 Report and 2020 Nuclear Report.

SECTION 3

3 DEVELOPMENT OF DEPRECIATION RATES

3.1 Depreciation

Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities, and, in the case of certain electric companies, the exhaustion of natural resources.¹³

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a time period by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing electric utility service. Normally, the time over which the fixed capital cost is allocated to the cost of service, is equal to the time over which an item renders service – that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the Straight-Line method of depreciation.

OPG continues to determine depreciation using the Straight-Line method for virtually all plant comprising regulated assets, based on the Average Life Group Procedure – Whole Life Technique. The Average Life Group Procedure is the most commonly used depreciation procedure for North American utilities, whereby one average service life estimate is applied to all assets and vintages within the asset class. The Whole Life Technique calculates depreciation on the basis of recovering the original cost of the investment over the entire life of an asset or group of assets with no provision for accumulated depreciation true-ups or depreciation rate adjustments. As such, a common life estimate is applied to each of the asset vintages, and each of the assets within each vintage. Concentric finds that the application of the Straight-Line method and the Average Life Group Procedure – Whole Life Technique continues to result in a reasonable recovery of OPG's capital investment over time and recommends their continued application.

For the regulated nuclear asset classes, depreciation continues to be based on the lesser of the generation station life and asset class life. The generation station life is determined using a life span date for each of the Pickering NGS and Darlington NGS, as discussed in section 3.2.7. Asset retirement costs capitalized in connection with asset retirement obligations recognized pursuant to US GAAP and certain other asset classes are depreciated to the life span dates.

¹³ Federal; Energy Regulatory Commission -Part 201- Uniform System of Accounts Prescribed for Electric Companies Subject to the Provisions of the Electric Act Definitions

3.2 Estimation of Generating Asset Lives

3.2.1 Average Service Life

The use of an average service life for property groups that include large numbers of similar assets implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a life estimate that considers the retirements of units which survive at successive ages. As in the 2011 Report, the 2013 Report and the 2020 Nuclear Report the average service life estimates in this study were reviewed by Concentric Advisors using judgment which considered a number of factors, including:

- Understanding of the processes used in the development of the current average service life estimates through the completion of the 2007 Report reviewing the DRC process and through the completion of the 2011 Report, the 2013 Report and the 2020 Nuclear Report assessing depreciation rates;
- Understanding of the assets currently in service through discussions with company staff, including representatives of the nuclear generation operating units;
- Physical site tours of nuclear generation sites;
- Review of current accounting practices and procedures applied and their consistency with those in place at the time of the 2020 Nuclear Report;
- Review of analyses provided to DRC, up to the results of the 2024 DRC process; and
- The general experience and professional judgment of Concentric Advisors.

3.2.2 Prior Assignments and Review of the DRC Process

As described in section 1.2, Concentric Advisors (then operating as Gannett Fleming) was previously retained in 2007 to review the practices and procedures used by the DRC to review depreciation expense, and, in 2011, 2013, 2019 and 2020 for the completion of depreciation studies for OPG's regulated assets. The 2007 review resulted in a report submitted to OPG management and filed by OPG in OEB proceeding EB-2007-0905. The 2013 depreciation study resulted in a report submitted to OPG management and filed by OPG in OEB proceeding EB-2013-0321. The 2020 depreciation study resulted in a report submitted to OPG management and filed by OPG in OEB proceeding EB-2020-0290. These prior reviews provided Concentric with an understanding of the type of generation plant in service at OPG, the processes used by OPG in the determination of service life estimates, and the OEB's regulatory oversight. In addition to updated information provided by OPG for this current review, Concentric considered information from these prior studies.

3.2.3 Operating Discussions and Site Tours

Discussions with operations representatives provided Concentric with an understanding of the type of assets in service for nuclear service. Previous site tours provided Concentric Advisors with the necessary background to make an assessment of the physical installations of the OPG plant, and to understand the type of plant in service and the operating conditions of the facilities. Operational interviews were undertaken to understand the historic operating conditions that have led to

retirement of plant in the past and to understand the current condition of the assets which may impact future retirement plans.

In conducting the 2013 depreciation study, Gannett Fleming toured the following generation sites:

- Darlington Nuclear Generating Station; and
- Pickering Nuclear Generating Station.

While it is typical practice to tour facilities being studied, the COVID-19 pandemic resulted in restrictions and increased safety risks associated with global travel and non-essential plant site access throughout 2020, making it impractical to safely tour OPG's nuclear facilities as part of the 2020 depreciation study.

In conducting the 2024 depreciation study, Concentric toured the following generation sites:

- Darlington Nuclear Generating Station.

Throughout the depreciation study process, interviews of the operational representatives were undertaken by Concentric. The interviews covered the following topics, including, where applicable, inquiries regarding operational or other changes since the 2020 Nuclear Report:

- Operating history of both nuclear generating stations;
- Replacement history of major plant components and review of significant retirement and life management programs at both plants;
- General operating experience of the major plant components;
- Review of any life restricting operational issues;
- Review of any issues that have emerged during the DRC process;
- Review of instances where advancements in technology may cause changes to average service life indications; and
- Review of the expected life span dates for all units at both plants.

3.2.4 Review of Accounting Policies

Concentric held discussions with finance management representatives during prior assignments to obtain and confirm understanding of OPG's depreciation and accounting policies and practices in accordance with US GAAP. As part of the current assignment, Concentric confirmed with finance management representatives that there had been no changes to these policies and practices since the 2020 Nuclear Report, including as they relate to capitalization thresholds, asset retirement obligations and treatment of retirement transactions.¹⁴

¹⁴ As previously noted in the 2013 Report (page II-7), OPG's accumulated depreciation accounts do not include embedded gains or losses from previous retirement transactions, as OPG books all such gains and losses to the income statement in the year of retirement in accordance with the provisions of US GAAP. As a result, there is no need to test the adequacy of accumulated depreciation balances. Concentric believes that the nature of the large plant components and small amount of retirement transactions continue to make this policy viable and reasonable for OPG.

3.2.5 Analysis and Results of DRC Reviews

OPG is the world's largest operator of Canada Deuterium Uranium ("CANDU") nuclear units, has some of the oldest CANDU units, and has the most extensive operational knowledge of all CANDU operators in the world. OPG is heavily involved in technical exchanges with other CANDU operators, and closely monitors equipment degradation issues in order to assess potential impacts on OPG's units. OPG is often the "lead" utility in terms of the knowledge of degradation issues that may impact unit and component lives. In the particular circumstance of the CANDU nuclear installations, OPG internal staff is recognized as experts in the technology.

The DRC has continued to complete detailed reviews of the average service life expectations for OPG's plant accounts. The DRC's technical reviews are conducted by internal experts in the specific areas associated with the different types of plant accounts, leveraging operational and industry experience. As part of the current assignment and the previous reports, Concentric reviewed these analyses which provided a significant background on the physical condition of the assets, a meaningful history of the manner in which plant assets have provided electric generation service in the past, and identified major upcoming replacement or retirement programs.

Since the completion of the 2020 Nuclear Report, the DRC completed a detailed review of the average service life expectations for plant accounts comprising close to 90 percent of the company's in-service investment in the regulated nuclear business, including the plant placed in service upon completing the refurbishment of Units 2, 3 and 1 of Darlington NGS over the 2020-2024 period.¹⁵ The DRC process resulted in a small number of changes to asset class depreciation rates since the 2020 Nuclear Report, which were reviewed by Concentric as part of this assignment.

3.2.6 Professional Judgement

The use of professional judgment in the development of average service life estimates is a practice that is appropriate and has been used for many years before North American regulatory jurisdictions. When available, the use of statistical analysis of the historic retirement transactions combined with the use of professional judgment, including physical site inspections, review of accounting procedures and practices, use of operational staff interviews, review of prior studies, and review of the approved life estimates of peer companies where applicable, provides the most complete method of service life analysis. However, the use of professional judgment alone also provides an appropriate basis for developing average service life estimates, when appropriate factors are considered, and has been accepted as a valuable depreciation analysis tool in many North American jurisdictions.

As previously noted by Concentric in the 2013 Report and the 2020 Nuclear Report, in the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed actuarial study of retirement history. As such, a retirement rate analysis was not completed by Concentric Advisors.

¹⁵ Percentage excludes asset retirement costs and certain other asset classes with service lives tied directly to the life span dates, which are inherently reviewed each time the life span dates are assessed.

3.2.7 Life Span Dates

Life expectancy of electric generation plant assets is impacted not only by physical wear and tear of the assets but also by economic factors including the feasibility of the economic replacement of major operating components or the economic viability of the plant as a whole. In circumstances where the replacement of major operating components is not economically feasible, the life of the major component can be the determining factor of the generation plant and all of the assets within the plant. As such, the remaining depreciation life of electric generation plant assets is the lesser of the physical life expectation of the asset or the period to the end of the life span of the generation plant as a whole.

The use of life span dates for determining depreciable lives for regulated electric generation plant is common throughout many North American regulatory jurisdictions. The basis for the determination of the life span date is usually based on one or more of the following:

- the physical life estimation of the major and vital components of the generating plant;
- the duration of operating licenses;
- precedent and policy of the regulatory jurisdiction;
- expiration of the supply source for which the generation plant is dependent; and
- expiration of market demand upon which the generation plant is dependent.

Through periodic DRC reviews, OPG regularly assesses if there are any potential indicators of changes in life span dates for each of the regulated nuclear plants. The life span dates are primarily determined through a review of the expected life of the significant components at each nuclear site, taking into account regulatory licensing and other requirements. Additionally, the life span dates are influenced by the period through to any required major unit refurbishment, as the plant's continued operation is dependent upon the ability to economically refurbish it for continued use. It is the experience of Concentric that the depreciation schedules for most North American nuclear generation plants are dependent upon appropriately developed life span dates, and it continues to be Concentric's view that the use of life span dates is appropriate for the OPG nuclear generation plants. OPG's practice of using a single life span date for all generating units at each nuclear station is consistent with that of other nuclear operators in North America.¹⁶

Concentric has reviewed the 2024 and prior DRC's analysis in establishing the life span dates in use by OPG for its regulated nuclear plants and concludes that they are reasonable for use in this study. Concentric is also of the view that the factors considered and methods used by the DRC in the assessment of life span dates remain appropriate and consistent with common regulatory practices and should continue to be used in future reviews.

Concentric is aware that OPG has been planning for a refurbishment of the four currently operating units at Pickering NGS (Units 5-8), which has now been approved to proceed and is scheduled to begin in 2027. It is anticipated that the four-unit refurbishment will be completed by the mid-2030's. Concentric understands that OPG has significantly progressed planning and preparation efforts,

¹⁶ OPG has maintained separate life span dates for Pickering Units 1 and 4 and Pickering Units 5-8, which were formerly considered and known as the Pickering A and Pickering B stations

including securing the necessary resources, to enable the refurbishment over the last two years. OPG also has demonstrated experience in executing similar work at Darlington NGS. OPG's technical analysis predicts that the refurbishment will allow the safe and reliable operation of the Pickering NGS units for approximately 38 years after returning to service, and OPG has also assessed the nuclear regulatory considerations related to the refurbishment.

Taking into account the progress made toward the planned refurbishment, the DRC has previously recommended to extend the average life span date for Pickering NGS (Units 5-8) to December 31, 2070. OPG has implemented this change, which Concentric supports. As part of continued surveillance, Concentric recommends that the station's average life span date be re-confirmed after the refurbishment project has been completed. As is the norm, Concentric recommends that OPG continue to accrue depreciation expense on the Pickering NGS assets over the period of the refurbishment outage.

Concentric is also aware that Pickering NGS Units 1 and 4 permanently ended commercial operation as of the end of 2024, as planned. Concentric confirmed that the associated plant assets were fully depreciated as of December 31, 2024.

In addition to the above, Concentric is aware that Darlington NGS continues to undergo refurbishment, with the last of the four units expected to be in service by 2026. As noted in previous reports, the DRC previously extended the station's average life span date until December 31, 2052, as it is expected that the refurbishment will allow for the safe and reliable operation of the station for another 30 years. As it did at the time of the 2020 Nuclear Report, OPG has confirmed that there have been no findings during the refurbishment that would indicate physical or economic reasons to change this expectation. As such, Concentric believes that continued use of the December 31, 2052 average life span date for Darlington NGS remains reasonable. As with Pickering NGS, Concentric recommends that this date be re-confirmed after the refurbishment project has been completed.

Additionally, Concentric is aware that OPG is currently building the first Small Nuclear Reactor ("SMR") facility in Canada. While work on this facility is ongoing, the first unit is scheduled to be placed into service in 2030. As this is the first facility of its kind in Canada and the world, the organization of investment into depreciable groups is still unknown. OPG has informed Concentric that the SMR has a design life of 60 years after the start of commercial operation. As such, Concentric deems it reasonable to depreciate these assets over a useful life of 60 years in the time between the completion of the SMR and the conducting of a more detailed componentization and depreciation analysis of the assets as part of the next depreciation study, a period anticipated to be within 1 – 2 years.

3.3 Average Service Life Assessments

3.3.1 Plant Accounts as of 2024 Year-End

Concentric has reviewed the average service life estimates for all regulated nuclear generation plant and asset categories, based on December 31, 2024 asset values. The service life estimates

recommendations were based on informed professional judgment, which incorporated a review of management’s plans, policies and outlook, and a general knowledge of the electric industry.

Based on the review, Concentric supports continued use of the average service lives as set out in Section 4, Table 1 of this study. This represents OPG’s currently approved average service lives (inclusive of the results of the 2024 DRC process), with recommended changes to the life estimates of the following accounts.

ACCOUNT 15122000 – NUCLEAR – SECURITY AND OTHER FENCING

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$94,018,350	20	15

The previously recommended life for this asset class was a 20-year average service life. Due to its relatively smaller investment percentage related to the overall plant, the DRC has not reviewed this account in recent years. However, the DRC did review Account 15121000 – Nuclear – Electronic Site Security System in 2023, confirming its average service life of 15 years. Due to security standards and regulatory oversight in place for nuclear generating stations, Concentric recommends shortening the average service life of this account to 15 years to be in line with Account 15121000.

ACCOUNT 15430000 – NUCLEAR – EXCITERS

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$17,150,404	30	35

The previously recommended life for this asset class was a 30-year average service life. Due to its relatively small size, the DRC has not reviewed this account in recent years. Given the extended operating horizon associated with refurbishment projects, the durability of exciter systems, and no observed retirements, Concentric recommends lengthening the average service life of this account to 35 years.

ACCOUNT 16540000 – ADMINISTRATIVE AND SERVICE BUILDINGS – ADMINISTRATIVE TELECOM EQUIPMENT

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$15,813,397	7	10

The previously recommended life for this asset class was a 7-year average service life. Due to its relatively small size, the DRC has not reviewed this account in recent years. A review of Canadian electric utilities suggests that a life of between 8 and 25 years is reasonable, however it is noted that peers often place a variety of asset types within this account. As OPG’s average service life is currently shorter than the peer range, Concentric recommends increasing the life of this account to 10 years.

SECTION 4

4 RESULTS OF STUDY

4.1 Results

The following tables provides summaries, by each asset group, of the original cost as of December 31, 2024, and the recommended average service life of each asset group.

Ontario Power Generation Inc.

**TABLE 1 - ESTIMATED SURVIVOR CURVE, ORIGINAL COST,
ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2024
DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

Account	Account Description	Current Service Life	Recommended Service Life	Original Cost as of Dec. 31, 2024	Accumulated Depreciation	Net Book Value	Calculated Annual Accrual Amount	Calculated Annual Accrual Rate
15000110	Nuclear - Intangibles - P5-8 & DG	55	55	\$ 15,325,984	\$ 4,591,695	\$ 10,734,290	\$ 278,654	1.82
15100000	Nuclear - Land	N/A	N/A	\$ 4,223,096	-	\$ 4,223,096	-	0.00
15110000	Nuclear - Site Improvements	75	75	\$ 26,690,686	\$ 6,440,705	\$ 20,249,980	\$ 355,876	1.33
15120000	Nuclear - Yard Facilities	50	50	\$ 28,075,090	\$ 4,327,451	\$ 23,747,639	\$ 561,502	2.00
15121000	Nuclear - Electronic Site Security System	15	15	\$ 233,748,715	\$ 170,916,489	\$ 62,832,226	\$ 15,583,248	6.67
15122000	Nuclear - Security and Other Fencing	20	15	\$ 94,018,350	\$ 82,952,680	\$ 11,065,670	\$ 6,267,890	6.67
15200000	Nuclear - Buildings and Structures	55	55	\$ 674,979,793	\$ 335,002,385	\$ 339,977,408	\$ 12,272,360	1.82
15210000	Nuclear - Roofing	25	25	\$ 72,390,799	\$ 10,082,996	\$ 62,307,803	\$ 2,895,632	4.00
15300000	Nuclear - Reactor Vessels - P1&4 and BG	40	40	\$ 7,046,499	\$ 7,046,499	-	\$ 176,162	2.50
15311000	Nuclear - Fuel Channel Assemblies - Pickering	25	25	\$ 333,931	\$ 333,931	-	\$ 13,357	4.00
15312000	Nuclear - Reactor Vessels - P5-8 & DG	55	55	\$ 1,674,537	\$ 144,298	\$ 1,530,239	\$ 30,446	1.82
15314000	Nuclear - Fuel Channel Assemblies - P5-8 and DG	30	30	\$ 1,136,491,395	\$ 101,440,619	\$ 1,035,050,776	\$ 37,883,046	3.33
15323000	Nuclear - Calandria Tubes - P5-8 and DG	30	30	\$ 495,808,578	\$ 53,137,606	\$ 442,670,972	\$ 16,526,953	3.33
15330000	Nuclear - Reactivity Control Units	40	40	\$ 145,972,481	\$ 45,877,463	\$ 100,095,018	\$ 3,649,312	2.50
15340000	Nuclear - Process Systems	55	55	\$ 5,961,455,556	\$ 1,012,979,882	\$ 4,948,475,674	\$ 108,390,101	1.82
15340900	Nuclear - Fuel - P5-8, BG3-8 and DG	30	30	\$ 50,271,886	\$ 3,624,084	\$ 46,647,801	\$ 1,675,730	3.33
15341100	Nuclear - Moderator Heat Exchangers - Pickering	25	25	\$ 42,475,576	\$ 42,475,576	-	\$ 1,699,023	4.00
15351100	Nuclear - Steam Generators - P5-8 & DG	30	30	\$ 418,019,747	\$ 27,969,934	\$ 390,049,813	\$ 13,933,992	3.33
15352000	Nuclear - Shutdown Cooling Heat Exchangers - Pickering	25	25	\$ 2,729,204	\$ 2,729,204	-	\$ 109,168	4.00
15352100	Nuclear - Shutdown Cooling Heat Exchangers - Darlington	30	30	\$ 326,215,805	\$ 35,762,493	\$ 290,453,312	\$ 10,873,860	3.33
15352100	Nuclear - Shutdown Cooling Heat Exchangers - Darlington (55 years)*	55	55	\$ 15,437,157	\$ 12,404,241	\$ 3,032,916	\$ 280,676	1.82
15352110	Nuclear - Post Refurb Shutdown Heat Exchangers	40	40	\$ 73,809,121	\$ 14,880,034	\$ 58,929,087	\$ 1,845,228	2.50
15360000	Nuclear - Irradiated Fuel Bays - P1&4 and BG	40	40	\$ 865,485	\$ 865,485	-	\$ 21,637	2.50
15361000	Nuclear - Irradiated Fuel Bays - P5-8 and DG	65	65	\$ 94,754,298	\$ 26,046,983	\$ 68,707,316	\$ 1,457,758	1.54
15370000	Nuclear - Tritium Removal Facility - DG	30	30	\$ 39,948,523	\$ 10,083,251	\$ 29,865,272	\$ 1,331,617	3.33
15400000	Nuclear - Turbines, Auxiliary Equipment, Steam Reheater Tubes - P1&4 and BG	40	40	\$ 26,942,687	\$ 23,958,037	\$ 2,984,650	\$ 673,567	2.50
15411100	Nuclear - Turbines, Auxiliary Equipment, Steam Reheater Tubes - P5-8 and DG	55	55	\$ 475,209,370	\$ 31,721,848	\$ 443,487,522	\$ 8,640,170	1.82
15412000	Nuclear - Turbine Blades & Diaphragms - DG	30	30	\$ 86,040,218	\$ 8,939,049	\$ 77,101,169	\$ 2,868,007	3.33
15421000	Nuclear - Generator Rotors, Stators & Auxiliary Systems - P5-8 and DG	55	55	\$ 586,858,737	\$ 57,238,367	\$ 529,620,369	\$ 10,670,159	1.82
15430000	Nuclear - Exciters	30	35	\$ 17,150,404	\$ 711,874	\$ 16,438,530	\$ 490,012	2.86
15432000	Nuclear - Generator Rotor Windings	30	30	\$ 65,728,531	\$ 3,083,961	\$ 62,644,570	\$ 2,190,951	3.33
15450000	Nuclear - Condenser Tubing - PICK and BRUCE A	30	30	\$ 117,314,393	\$ 117,314,393	-	\$ 3,910,480	3.33
15452000	Nuclear - Condenser Tubing - BRUCE B and DARL	30	30	\$ 5,641,234	\$ 49,926	\$ 5,591,308	\$ 188,041	3.33
15460000	Nuclear - Auxiliary Systems - P1&4 and BG	40	40	\$ 49,813,142	\$ 49,810,552	\$ 2,590	\$ 1,245,329	2.50
15461000	Nuclear - Auxiliary Systems - P5-8 and DG	55	55	\$ 119,210,852	\$ 36,038,064	\$ 83,172,787	\$ 2,167,470	1.82
15500000	Nuclear - Main Power Output System	35	35	\$ 211,427,154	\$ 79,880,903	\$ 131,546,251	\$ 6,040,776	2.86
15501000	Nuclear - Revenue Metering - Main Power Output, Instrumentation and Control - PICK/DARL	30	30	\$ 11,845,350	\$ 10,985,039	\$ 860,310	\$ 394,845	3.33
15510000	Nuclear - Station Service Main Transformation and AC Power Distribution Systems - P1&4 and BG	40	40	\$ 29,897,378	\$ 29,787,274	\$ 110,104	\$ 747,434	2.50
15511000	Nuclear - Station Service Main Transformation and AC Power Distribution Systems - P5-8 and DG	55	55	\$ 68,985,429	\$ 17,508,097	\$ 51,477,332	\$ 1,254,281	1.82

Ontario Power Generation Inc.

**TABLE 1 - ESTIMATED SURVIVOR CURVE, ORIGINAL COST,
 ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2024
 DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

Account	Account Description	Current Service Life	Recommended Service Life	Original Cost as of Dec. 31, 2024	Accumulated Depreciation	Net Book Value	Calculated Annual Accrual Amount	Calculated Annual Accrual Rate
15521000	Nuclear - Station Service Main Transformation and Power Distribution Systems	20	20	\$ 97,993,339	\$ 23,741,703	\$ 74,251,636	\$ 4,899,667	5.00
15530000	Nuclear - Building Electrical Service Supply - P1&4 and BG	40	40	\$ 7,446,117	\$ 5,527,015	\$ 1,919,103	\$ 186,153	2.50
15531000	Nuclear - Building Electrical Service Supply - P5-8 and DG	55	55	\$ 43,946,792	\$ 5,262,059	\$ 38,684,733	\$ 799,033	1.82
15541000	Nuclear - Electrical Auxiliary Systems - P5-8 and DG	55	55	\$ 3,414,465	\$ 1,366,484	\$ 2,047,981	\$ 62,081	1.82
15550000	Nuclear - Reactor Building Cabling - P1&4 and BG	40	40	\$ 61,733,828	\$ 61,733,828	-	\$ 1,543,346	2.50
15551000	Nuclear - Reactor Building Cabling - P5-8 and DG	55	55	\$ 24,644,827	\$ 2,124,193	\$ 22,520,634	\$ 448,088	1.82
15560000	Nuclear - AC Standby Power - P1&4 and BG	40	40	\$ 59,290,226	\$ 55,720,884	\$ 3,569,342	\$ 1,482,256	2.50
15561000	Nuclear - AC Standby Power - P5-8 and DG	55	55	\$ 466,693,559	\$ 203,799,075	\$ 262,894,483	\$ 8,485,337	1.82
15600000	Nuclear - Instrumentation and Control	15	15	\$ 779,451,692	\$ 529,800,286	\$ 249,651,407	\$ 51,963,446	6.67
15600000	Nuclear - Instrumentation and Control (55 years)*	55	55	\$ 105,721,680	\$ 27,702,925	\$ 78,018,755	\$ 1,922,212	1.82
15610000	Nuclear - Instrumentation and Control (Refurbishment)	30	30	\$ 126,802,474	\$ 16,753,794	\$ 110,048,680	\$ 4,226,749	3.33
15700000	Nuclear - Circulating Water - P1&4 and BG	40	40	\$ 29,974,670	\$ 29,090,079	\$ 884,591	\$ 749,367	2.50
15701000	Nuclear - Service Water and Fire Protection System	25	25	\$ 505,879,517	\$ 327,215,611	\$ 178,663,907	\$ 20,235,181	4.00
15701000	Nuclear - Service Water and Fire Protection System (55 years)*	55	55	\$ 99,460,636	\$ 42,407,714	\$ 57,052,922	\$ 1,808,375	1.82
15701100	Nuclear - Service Water and Fire Protection System (Refurbished)	30	30	\$ 110,335,689	\$ 15,777,306	\$ 94,558,383	\$ 3,677,856	3.33
15701110	Nuclear - Service Water and Fire Protection System (Post Refurbishment)	40	40	\$ 40,878,622	\$ 7,308,595	\$ 33,570,027	\$ 1,021,966	2.50
15710000	Nuclear - Water Treatment Plant	20	20	\$ 118,484,861	\$ 26,128,697	\$ 92,356,164	\$ 5,924,243	5.00
15711000	Nuclear - Circulating Water - P5-8 and DG	55	55	\$ 26,367,023	\$ 8,219,565	\$ 18,147,458	\$ 479,400	1.82
15713000	Nuclear - Water Treatment Plant (30 years)	30	30	\$ 68,102,381	\$ 1,402,880	\$ 66,699,501	\$ 2,270,079	3.33
15720000	Nuclear - Common Service Systems	35	35	\$ 640,884,842	\$ 307,221,870	\$ 333,662,972	\$ 18,310,995	2.86
15720000	Nuclear - Common Service Systems (55 years)*	55	55	\$ 58,000,228	\$ 14,533,391	\$ 43,466,838	\$ 1,054,550	1.82
15721000	Nuclear - Common Service Systems - Air Compressors	20	20	\$ 1,098,220	\$ 1,098,220	-	\$ 54,911	5.00
15810000	Nuclear - Heavy Water	100	100	\$ 413,342	\$ 58,143	\$ 355,199	\$ 4,133	1.00
15990000	Nuclear - Alternate Spares	100	100	\$ 10,569,645	\$ 10,098,517	\$ 471,128	\$ 105,696	0.00
15991000	Nuclear - Major / Strategic Spares	100	100	\$ 173,566,488	\$ 69,314,482	\$ 104,252,006	\$ 1,735,665	0.00
15991200	Nuclear - Large Circulating Water Motors - Over 200 Hp	30	30	\$ 120,952,361	\$ 24,416,449	\$ 96,535,912	\$ 4,031,745	3.33
16210000	Administrative and Service Buildings - Permanent Buildings, Roads and Site Improvements	50	50	\$ 224,293,272	\$ 64,333,358	\$ 159,959,914	\$ 4,485,865	2.00
16211000	Administrative and Service Buildings - Buildings - Leased	10	10	\$ 13,127,729	\$ 13,086,242	\$ 41,488	\$ 1,312,773	10.00
16220000	Administrative and Service Buildings - Buildings	10	10	\$ 191,685	\$ 76,674	\$ 115,011	\$ 19,169	10.00
16230000	Administrative and Service Buildings - Buildings - Frame & Metal Clad	25	25	\$ 196,053,932	\$ 65,997,036	\$ 130,056,896	\$ 7,842,157	4.00
16310000	Administrative and Service Buildings - Nuclear Training Simulators	45	45	\$ 58,538,263	\$ 36,476,828	\$ 22,061,435	\$ 1,300,850	2.22
16311000	Administrative and Service Buildings - Nuclear Simulator - Design Upgrades	10	10	\$ 2,333,721	\$ 2,333,721	-	\$ 233,372	10.00
16500000	Administrative and Service Buildings - Distribution Systems	35	35	\$ 3,778,584	\$ 391,295	\$ 3,387,289	\$ 107,960	2.86
16540000	Administrative and Service Buildings - Administrative Telecom Equipment	7	10	\$ 15,813,987	\$ 14,389,478	\$ 1,424,509	\$ 1,581,399	10.00
16550000	Administrative and Service Buildings - LAN Cable	10	10	\$ 5,791,142	\$ 4,760,019	\$ 1,031,123	\$ 579,114	10.00
16551000	Administrative and Service Buildings - LAN Control Devices	5	5	\$ 33,145,485	\$ 18,347,905	\$ 14,797,581	\$ 6,629,097	20.00
16560100	Administrative and Service Buildings - Intangibles Administration System Software	5	5	\$ 91,076,117	\$ 54,209,140	\$ 36,866,977	\$ 18,215,223	20.00
16630000	Administrative and Service Buildings - Building Systems & Equipment	20	20	\$ 20,792,499	\$ 5,299,463	\$ 15,493,037	\$ 1,039,625	5.00
18460000	Communications - Data Acquisition Equipment, Human Machine Interface Equipment	15	15	\$ 2,244,038	\$ 472,384	\$ 1,771,654	\$ 149,603	6.67
18500000	Communications - Radio Equipment	15	15	\$ 2,909,197	\$ 2,781,951	\$ 127,246	\$ 193,946	6.67

Ontario Power Generation Inc.

**TABLE 1 - ESTIMATED SURVIVOR CURVE, ORIGINAL COST,
ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2024
DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

Account	Account Description	Current Service Life	Recommended Service Life	Original Cost as of Dec. 31, 2024	Accumulated Depreciation	Net Book Value	Calculated Annual Accrual Amount	Calculated Annual Accrual Rate
18540000	Communications - Administrative Telecom Equipment	7	7	\$ 54,565,178	\$ 43,666,146	\$ 10,899,032	\$ 7,795,025	14.29
18541000	Communications - Administrative Telecom Equipment - Revenue Metering	7	7	\$ 1,764,286	\$ 1,764,286	-	\$ 252,041	0.00
18630000	Communications - Optical Wire	25	25	\$ 6,425,897	\$ 629,408	\$ 5,796,488	\$ 257,036	4.00
18633000	Communications - Optical Wire - Revenue Metering	30	30	\$ 133,599	\$ 127,078	\$ 6,521	\$ 4,453	3.33
COMP1	Computers	5	5	\$ 1,586,260	\$ 1,371,912	\$ 214,348	\$ 317,252	20.00
OFFICE1	Office Furniture and Fixtures	3	3	\$ 1,633,628	\$ 1,633,628	-	\$ 544,543	33.33
SERV1	Minor Fixed Assets - Service Equipment	10	10	\$ 791,779,378	\$ 581,185,198	\$ 210,594,181	\$ 79,177,938	10.00
SERV2	Darlington Refurbishment Removal Tools	10	10	\$ 108,774,455	\$ 108,720,028	\$ 54,427	\$ 10,877,445	10.00
T&WE1	Transportation and Work Equipment	10	10	\$ 19,679,876	\$ 15,307,835	\$ 4,372,040	\$ 1,967,988	10.00
Total Plant				\$ 17,273,366,906	\$ 5,334,328,143	\$ 11,939,038,762	\$ 561,961,156	
Asset Retirement Costs (ARC)						\$ 522,220,985		
Grand Total						\$ 12,461,259,747		

* Represents Darlington assets identified by OPG for transfer to a separate class to align with the station's post-refurbishment life span assumption. While the new asset classes have not yet been created in OPG's fixed asset system, updated service lives are being applied by OPG in the calculation of depreciation for these assets.

MEMORANDUM

2024 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2024 Depreciation Review Committee Recommendations for Nuclear Regulated facilities is requested.

Submitted by:



Promita Datta – Director, External Reporting and Accounting Policy

March 28, 2025

Date

Approved by:



Steve Gregoris – Chief Nuclear Officer

March 31, 2025

Date



Aida Cipolla – Chief Financial Officer & Chief Administrative Officer

March 31, 2025

Date



Brenda MacDonald – Chief Commercial Officer

March 31, 2025

Date

2024

DEPRECIATION REVIEW COMMITTEE
RECOMMENDATIONS

FOR

NUCLEAR

MARCH 2025

MEMORANDUM

2024 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2024 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 (Pickering), the Darlington Nuclear Generating Station (Darlington), and the Bruce Nuclear Generating Stations (Bruce).

BACKGROUND

The DRC convenes 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 is considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG's depreciation rates 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, "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. 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."¹

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the nuclear business was performed by Concentric in 2020. Concentric's report on OPG's depreciation rates dated December 28, 2020 was submitted to the OEB as part of OPG's application for 2022-2026 payment amounts, and its results were reflected in the OEB-approved settlement agreement on the application. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the nuclear assets in 2021. This report is the fourth year of the five-year cycle. Another Concentric depreciation assessment is currently underway and the results of the review will be considered in the next DRC report.

SCOPE OF 2024 DRC REVIEW FOR NUCLEAR

Station Service Lives

On September 29, 2022, the Province of Ontario (Province) announced its support for the continued safe operation of Pickering, which includes Units 1 and 4 operating to the end of September 2024 and December 2024, respectively, and Units 5 to 8 operating until the end of September 2026. Additionally, as requested by the Province, OPG completed an updated feasibility assessment for the refurbishment of Units 5 to 8 at Pickering in 2023 and concluded that the refurbishment is technically and economically feasible. In August 2023, OPG's Board of Directors agreed with and authorized OPG to submit the feasibility assessment to the Province. In January 2024, the Province announced their support for OPG proceeding with next steps toward refurbishing Units 5 to 8 at Pickering, which was detailed in the 2023 DRC Report. The 2023 DRC

¹ Concentric reached a similar conclusion with respect to OPG's depreciation review practice in its report on OPG's depreciation rates dated December 28, 2020.

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2024 Depreciation Review Committee Recommendations – Nuclear

Report recommended an extension of the average nuclear station end-of-life (EOL) date for Units 5 to 8 at Pickering to December 31, 2070, based on an assessment of sufficient high confidence in the continued operation of the station to September 2026 and the planned subsequent refurbishment of the units. The assessment took into account, among others, the then-current status of Canadian Nuclear Safety Commission (CNSC) regulatory approvals, the work program completed to demonstrate fitness-for-service of major components prior to refurbishment, the results of the refurbishment feasibility assessment including preliminary scope recommendations, refurbishment schedule and post-refurbishment target operating period, the Province’s support for the project to date, and the role of Pickering in Ontario’s electricity system. On January 23, 2025, the Province announced its approval of OPG’s plan to proceed with the project definition phase as the next step toward refurbishing Units 5 to 8 at Pickering.

The 2024 DRC considered whether it was aware of any evidence justifying a change in the current accounting EOL date for Units 5 to 8 at Pickering, Darlington, Bruce A or Bruce B stations. As planned, Units 1 and 4 at Pickering ceased commercial operation, were taken offline during 2024 and are being placed in a safe storage state.

Asset Class Review

Ten in-service nuclear major fixed asset classes were selected for the 2024 DRC review as part of the five-year cycle. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in the previous years of the 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
15000110 – Nuclear – Intangibles – Darlington and Pickering B
15110000 – Nuclear – Site Improvements
15314000 – Nuclear – Nuclear Fuel Channels – Darlington and Pickering B
15323000 – Nuclear – Calandria Tubes – Darlington and Pickering B
15361000 – Nuclear – Irradiated Fuels Bay – Darlington and Pickering B
15430000 – Nuclear – Exciters
15511000 – Nuclear – Station Main Transformers – Darlington and Pickering B
15531000 – Nuclear – Building Electrical Service – Darlington and Pickering B
15710000 – Nuclear – Water Treatment Plant
16210000 – Administration & Services – Site Improvements

Excluding asset retirement costs and other asset classes with service lives tied directly to the overall station service lives, approximately 16% of the total in-service net book value of the fixed asset classes of the nuclear business as at December 31, 2024 was studied in the 2024 DRC review. Combined with the previous DRC reviews in the cycle, 88% of such total in-service fixed assets of the regulated nuclear business now have been covered. Asset classes with service lives tied directly to the overall station service lives are considered to be reviewed each time the DRC reviews the station EOL dates.

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2024 Depreciation Review Committee Recommendations – Nuclear

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;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Station Service Lives Review

The DRC confirmed that no new information became available in 2024 that would justify a change in the station EOL of Units 5 to 8 at Pickering or the Darlington station.

The DRC received information indicating increasing technical confidence in the ability to operate Bruce Units 3-8 beyond the current end-of-life assumptions. Bruce A (Units 1-4) and Bruce B (Units 5-8) EOL dates were last revised as of the end of 2015 in line with those estimated for each of the units in the Amended and Restated Bruce Power Refurbishment Implementation Agreement (“ARBPRIA”) between the Independent Electricity System Operator (“IESO”) and Bruce Power LP (“Bruce Power”) entered around that time. Those dates reflected the refurbishment plans for Bruce Units 3-8, with ARBPRIA creating a positive obligation on Bruce Power to refurbish these units. Bruce Power is currently progressing through these refurbishments.

In assessing whether to recommend any changes to the Bruce A or Bruce B EOL dates, the DRC noted that the ARBPRIA ends on December 31, 2064 and, to OPG’s knowledge, there has been no formal agreement to extend this date. On this basis, the DRC concluded that there is insufficient evidence to extend the EOL date of the Bruce stations beyond December 31, 2064, notwithstanding technical feasibility of operating any of these units beyond such date. Given that extending the current EOL dates based on operating Bruce Units 3-8 to 2064 would represent a relatively small impact and as the dates would remain subject to reassessment based on the actual timing of Bruce Power completing the unit refurbishments, the DRC recommended to retain the existing EOL dates for the Bruce A and Bruce B stations for this review and will continue to monitor these developments in the future.

The current average nuclear station EOL dates are recommended to remain effective as follows:

Darlington	December 31, 2052
Pickering Units 5-8	December 31, 2070
Bruce A	December 31, 2052
Bruce B	December 31, 2061

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2024 Depreciation Review Committee Recommendations – Nuclear

Asset Class Review

A summary of the conclusions from the 2024 DRC review of the average service lives of the nuclear asset classes is outlined below:

Asset Class	Recommendation
15000110 – Nuclear – Intangibles – Darlington and Pickering B	Retain the current 55 years average service life
15110000 – Nuclear – Site Improvements	Retain the current 75 years average service life
15314000 – Nuclear – Nuclear Fuel Channels – Darlington and Pickering B	Retain the current 30 years average service life
15323000 – Nuclear – Calandria Tubes – Darlington and Pickering B	Retain the current 30 years average service life
15361000 – Nuclear – Irradiated Fuels Bay – Darlington and Pickering B	Retain the current 65 years average service life
15430000 – Nuclear – Exciters	Retain the current 30 years average service life
15511000 – Nuclear – Station Main Transformers – Darlington and Pickering B	Retain the current 55 years average service life
15531000 – Nuclear – Building Electrical Service – Darlington and Pickering B	Retain the current 55 years average service life
15710000 – Nuclear – Water Treatment Plant	Retain the current 20 years average service life
16210000 – Administration & Services – Site Improvements	Retain the current 50 years average service life

There is no impact on the depreciation expense.

Summary of Impact

Based on the recommendations above, there is no impact on annual depreciation expenses for the nuclear business.

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2024 Depreciation Review Committee Recommendations – Nuclear

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
Steve Gregoris	Chief Nuclear Officer
Aida Cipolla	Chief Financial Officer & Chief Administrative Officer
Brenda MacDonald	Chief Commercial Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Senior Vice President, Chief Controller & Accounting Officer
Promita Datta	Director, External Reporting and Accounting Policy
Matthew Kirk	Director, Ontario Regulatory Affairs
Graeme Mumberson	Senior Manager, External Reporting and Accounting Policy
Stephanie Leung	Senior Manager, Investment Management
Peter Hassan	Director, Engineering Services

The Key Technical Contacts are:

Name	Position
Zeeshan Mustafa (Technical Coordinator)	Senior Advisor, Investment Management
Hassan Qadri	Director, Station Engineering
Stephen Harrington	Director, Station Engineering



MEMORANDUM

2023 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2023 Depreciation Review Committee Recommendations for Nuclear Regulated facilities is requested.

Submitted by:

Handwritten signature of Promita Datta in black ink.

Promita Datta – Director, External Reporting and Accounting Policy

March 25, 2024
Date

Approved by:

Handwritten signature of Steve Gregoris in black ink.

Steve Gregoris – Chief Nuclear Officer

March 29, 2024
Date

Handwritten signature of Aida Cipolla in black ink.

Aida Cipolla – Chief Financial Officer

March 29, 2024
Date

Handwritten signature of Brenda MacDonald in black ink.

Brenda MacDonald – Chief Commercial Officer

March 29, 2024
Date

2023
DEPRECIATION REVIEW COMMITTEE
RECOMMENDATIONS

FOR
NUCLEAR

MARCH 2024

MEMORANDUM

2023 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2023 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 (Pickering), the Darlington Nuclear Generating Station (Darlington), and the Bruce Nuclear Generating Stations (Bruce).

BACKGROUND

The DRC convenes 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 is considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG's depreciation rates 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, "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. 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."¹

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the nuclear business was performed by Concentric in 2020. Concentric's report on OPG's depreciation rates dated December 28, 2020 was submitted to the OEB as part of OPG's application for 2022-2026 payments amounts, and its results were reflected in the OEB-approved settlement agreement on the application. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the nuclear assets in 2021. This report is the third year of the five-year cycle.

SCOPE OF 2023 DRC REVIEW FOR NUCLEAR

Station Service Lives

On September 29, 2022, the Province of Ontario (Province) announced its support for the continued safe operation of Pickering, which includes Units 1 and 4 operating to the end of September 2024 and December 2024, respectively, and Units 5 to 8 operating until the end of September 2026. Additionally, as requested by the Province, OPG completed an updated feasibility assessment for the refurbishment of Units 5 to 8 at Pickering in 2023 and concluded that the refurbishment is technically and economically feasible. In August 2023, OPG's Board of Directors agreed with and authorized OPG to submit the feasibility assessment to the Province. In January 2024, the Province announced their support for OPG proceeding with next steps toward refurbishing Units 5 to 8 at Pickering.

¹ Concentric reached a similar conclusion with respect to OPG's depreciation review practice in its report on OPG's depreciation rates dated December 28, 2020.

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2023 Depreciation Review Committee Recommendations – Nuclear

The 2023 DRC assessed whether the current accounting end-of-life (EOL) date for Units 5 to 8 at Pickering should be extended in view of the recent developments related to the refurbishment. The 2023 DRC also considered whether it was aware of any evidence justifying a change in the estimated service lives of the Darlington, Bruce A or Bruce B stations.

Asset Class Review

Eight in-service nuclear major fixed asset classes and one minor fixed asset class were selected for the 2023 DRC review as part of the five-year cycle. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in the previous years of the 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
15120000 – Nuclear – Yard Facilities
15121000 – Nuclear – Electrical Security System
15352100 – Nuclear – Shutdown Cooling Heat Exchangers - Darlington
15370000 – Nuclear – Tritium Removal Facilities - Darlington
15400000 – Nuclear – Turbines, Auxiliary Equipment, Steam Reheater Tubes – Pickering A and Bruce
15450000 – Nuclear – Condenser Tubing – Pickering A and Bruce
15461000 – Nuclear – Auxiliary Systems – Pickering B and Darlington
15701000 – Nuclear – Water and Fire Protection
Serv2 – Removal Tools for Darlington Refurb

Excluding asset retirement costs and other asset classes with services lives tied directly to the overall station service lives, approximately 7% of the total in-service net book value of the fixed asset classes of the nuclear business as at December 31, 2023 was studied in the 2023 DRC review. Combined with the previous DRC reviews in the cycle, 72% of such total in-service fixed assets of the nuclear business now have been covered. 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 EOL dates.

Darlington Refurbishment

With the refurbishment of Darlington’s Unit 2 completed in June 2020, the DRC previously initiated a process to identify and review any significant existing Darlington assets that were placed in-service prior to refurbishment, with remaining service lives shorter than the 30-year post-refurbishment life assumption of the Units. The objective of this process is to confirm that the depreciation periods for those existing Darlington assets expected to support the post refurbishment life remain appropriately aligned. In 2021, this review focused on Unit 2 where a selection of significant assets and projects with remaining service lives shorter than the 30-year post-refurbishment life assumption for the Darlington reactors was studied. Starting in 2022, this review was expanded to the remaining Darlington Units, with a selection of significant assets and projects with remaining service lives shorter than the 30-year post-refurbishment life assumption were selected for testing. In 2023, nineteen such assets and projects was selected for testing within eight asset classes. Following the 2023 DRC review, the significant Darlington assets that were placed in-service

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2023 Depreciation Review Committee Recommendations – Nuclear

prior to the refurbishment have now been reviewed and their depreciation periods are considered to be appropriately aligned.

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;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Station Service Lives Review

The DRC recommends extending the overall station EOL date for Units 5 to 8 at Pickering, for accounting purposes, to December 31, 2070, based on an assessment of sufficient high confidence in the planned refurbishment of the units, as discussed below. The DRC also confirmed that no new information became available in 2023 that would justify a change in the station EOL dates of the Darlington, Bruce A or Bruce B stations, as well as Units 1 and 4 at Pickering.

The DRC's recommendation to extend the station EOL date for Units 5 to 8 at Pickering took into account the following:

- a) High confidence that the Pickering refurbishment project can be successfully executed and units returned to service for long-term operations, based on the results and OPG Board of Directors' approval of the refurbishment feasibility assessment. Operating and project experience from other facilities (i.e., Darlington and other CANDU facilities), subject-matter expert input, and independent third-party reviews by experienced vendors were used to inform refurbishment scope recommendations as well as strategies for execution, as outlined in the feasibility assessment. The outcome of these evaluations, taking into account the complexity and practicality of proposed modifications and scope, provided the basis for the assessment of the project's economic viability.
- b) The Province's January 2024 announcement supporting OPG to proceed with next steps toward refurbishing these units. Such pre-execution phase activities include preliminary engineering work and securing long-lead components, as approved by the OPG Board of Directors with a budget of approximately \$2 billion. The refurbishment of Units 5 to 8 at Pickering forms part of the Province's *Powering Ontario's Growth* plan, released in 2023, which outlines the actions being taken to meet anticipated electricity demand and reduce emissions in Ontario. As indicated by the Province, the Independent Electricity System Operator (IESO) has concluded that the refurbishment would provide better overall ratepayer value compared to non-emitting generation alternatives.
- c) A number of factors that, collectively, indicate the significant role of the refurbished units as part of Ontario's future energy infrastructure. Based on modelling conducted in support of the feasibility assessment, OPG anticipates that Units 5 to 8 at Pickering are required to meet Ontario's forecast electricity demand growth into the 2030s and beyond. The refurbishment would provide such clean baseload power to a strategic location on the grid at a time of potential limitations on future gas generation. Furthermore, the IESO's Pathways to Decarbonization report, issued in 2022, indicated that as much as 18 gigawatts of additional nuclear generation capacity (assuming retirement of all Pickering units) would be required in the province by 2050. The refurbishment of Units 5 to 8 at

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Pickering would contribute over 2,000 megawatts to meet this need, and together with OPG's Darlington New Nuclear Project, is the only additional nuclear generation resource that can be made available with sufficient certainty by the mid-2030s. In addition to helping meet Ontario and Canada's net zero goals, the refurbishment will also boost Ontario's GDP and enable a large number of jobs in the province, providing significant long-term economic and social benefits.

- d) A preliminary refurbishment schedule and a post-refurbishment target operating period of up to 38 years, based on 300,000 equivalent full-power hours of operation, developed as part of the technical feasibility assessment based on the replacement of fuel channel assemblies and other proposed refurbishment scope.
- e) With planning work ongoing to determine which refurbishment activities can be conducted under the existing CNSC operating licence for Pickering, valid until August 31, 2028, and which would require licence amendments and renewals, there is low risk, based on similar refurbishment projects already underway and well-established technical and regulatory processes for refurbishment, that the execution of the refurbishment would not be completed.

The DRC also considered that the operation of any Pickering unit beyond December 31, 2024 requires authorization by the Canadian Nuclear Safety Commission (CNSC). Based on the status of the regulatory work in support of obtaining CNSC's approval for operating Units 5 to 8 through 2026, the 2022 DRC review concluded that OPG did not yet have the requisite high confidence to extend the station EOL date to reflect such operation. Since then, in June 2023, OPG submitted an application to the CNSC to request authorization to operate Units 5 to 8 through 2026. While the public hearing on the application is scheduled in June 2024, the DRC observes that OPG has taken a number of steps to be in a good position to achieve a successful outcome. In addition to demonstrating a continued strong record of operational safety and having programs in place to support the provision of safe and reliable service, OPG submitted the three key reports of the Periodic Safety Review (PSR) to the CNSC during 2023, being the Global Issues Assessment Report, the Global Assessment Report, and the Integrated Implementation Plan (IIP). The PSR has confirmed that there is a high level of safety throughout the continued operation of Units 5-8 through 2026. The IIP, which documents new actions to support such operation, was accepted by the CNSC in July 2023; the actions either have been completed or are on track for completion by the end of 2024. The DRC concludes that, taken together, the current status of CNSC regulatory approvals, the work program completed to demonstrate fitness-for-service of fuel channels and other major components, the strategy and life cycle management plans in place to manage fuel channel aging, and the Province's endorsement of OPG's plan for continued operation of Units 5 to 8 now provides sufficient high confidence for the continued operation of the units to September 2026, prior to commencing the planned refurbishment.

Based on the above, the following average nuclear station EOL dates are recommended to be effective from December 31, 2023:

Darlington	December 31, 2052
Pickering Unit 1	September 30, 2024
Pickering Unit 4	December 31, 2024
Pickering Units 5-8	December 31, 2070
Bruce A	December 31, 2052
Bruce B	December 31, 2061

In conjunction with the recommendation to extend the station EOL date for Units 5 to 8 at Pickering, the DRC conducted an initial review of assets currently comprising these units with the goal of identifying which such assets are expected to be replaced through the refurbishment and which would support post-

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2023 Depreciation Review Committee Recommendations – Nuclear

refurbishment operations. For those assets expected to be replaced through the refurbishment, the DRC recommends limiting the depreciation period at September 30, 2026, rather than at the new station EOL date of December 31, 2070, based on the planned operation of Units 5 to 8 prior to the refurbishment. The analysis was based on the proposed refurbishment scope for major components and operational experience and will be refined as necessary in future DRC reviews as refurbishment planning and execution activities progress. Appendix A set out the asset classes and associated net book values that the DRC has concluded should be subject to the September 30, 2026 depreciation period limitation.

As a result of the above recommended changes to the station EOL date and depreciation periods for Units 5 to 8 at Pickering, the annual depreciation expense is expected to decrease by approximately \$86 million, excluding asset retirement costs, effective January 1, 2024. Before adjustments to the asset retirement costs recorded as of December 31, 2023 in connection with the changes to the station EOL date for Units 5 to 8, their annual depreciation expense is expected to decrease by approximately \$42 million as a result of the above recommendations, effective January 1, 2024.

Asset Class Review

A summary of the conclusions from the 2023 DRC review of the average service lives of the nuclear asset classes is outlined below:

Asset Class	Recommendation
15120000 – Nuclear – Yard Facilities	Change the service life of the Darlington Vehicle Screening Facility based on technical data from the manufacturer, by transferring it into a new asset class with a service life of 15 years, from the current 50 years. Retain the current 50 years average service life for the remaining assets in this asset class.
15121000 – Nuclear – Electrical Security System	Retain the current 15 years average service life
15352100 – Nuclear – Shutdown Cooling Heat Exchangers – Darlington	Retain the current 30 years average service life
15370000 – Nuclear – Tritium Removal Facilities – Darlington	Retain the current 30 years average service life
15400000 – Nuclear – Turbines, Auxiliary Equipment, Steam Reheater Tubes – Pickering A and Bruce	Retain the current 40 years average service life
15450000 – Nuclear – Condenser Tubing – Pickering A and Bruce	Retain the current 30 years average service life
15461000 – Nuclear – Auxiliary Systems – Pickering B and Darlington	Retain the current 55 years average service life
15701000 – Nuclear – Water and Fire Protection	Retain the current 25 years average service life
Serv2 – Removal Tools for Darlington Refurb	Retain the current life to the end of Darlington refurbishment removal period

Based on the book values of the affected classes, the above recommendation is expected to increase the annual depreciation expense by approximately \$0.8 million, effective January 1, 2024.

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2023 Depreciation Review Committee Recommendations – Nuclear

Darlington Refurbishment

A summary of the conclusions from the internal study of the significant existing Darlington assets placed in-service prior to refurbishment with remaining service lives shorter than the 30-year post-refurbishment life assumption for the reactors is outlined below:

Project and Asset Name	Asset Class	Recommendation and Summary Rationale
84399 Darlington Radiation Detection Equipment Obsolescence Moderator Cover Gas	15600000 Nuclear – Instrumentation and Control	Align average service life with the assumed end of life of refurbished Darlington reactors, based on operating expectations and preventative maintenance programs in place, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
62522 Darlington Loss of Flow Trip Coverage	15352100 Nuclear – Shutdown Cooling Heat Exchangers	Align average service life with the assumed end of life of refurbished Darlington reactors based on operating expectations, by transferring into a new asset class with a service life of 55 years, from the current 30 years.
34000 Darlington Auxiliary Heating Steam Facility	15720000 Nuclear – Common Service Systems	Align average service life with the assumed end of life of refurbished Darlington reactors, based on operating expectations and preventative maintenance programs in place, by transferring into a new asset class with a service life of 55 years, from the current 35 years.
82967 Darlington Park & Holt Road Bridge	16230000 Admin & Serv Buildings – Frame & Metal Clad	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83436 2017 Darlington Parking Lot Lighting	16230000 Admin & Serv Buildings – Frame & Metal Clad	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83860 Grounds Maintenance Complex	16230000 Admin & Serv Buildings – Frame & Metal Clad	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
84697 2021 Darlington ESSB 3rd Floor Workplace Transformation	16230000 Admin & Serv Buildings – Frame & Metal Clad	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
84400 Darlington Radiation Detection Equipment Obsolescence Replacement	15600000 Nuclear – Instrumentation and Control	Retain the current 15 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.

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2023 Depreciation Review Committee Recommendations – Nuclear

33904 Darlington Plant Information Sys Addition to Main Control Room	15600000 Nuclear – Instrumentation and Control	Retain the current 15 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
80123 Darlington Group II Pressure Transmitter Replacement	15600000 Nuclear – Instrumentation and Control	Retain the current 15 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31412 Class II Uninterruptible Power Supply Replacement-Darlington	15521000 Nuclear – Station Service Main Transformation & Power Distribution	Retain the current 20 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33258 Darlington Emergency Power Systems Uninterruptible Power Supply Replacement-Darlington	15521000 Nuclear – Station Service Main Transformation & Power Distribution	Retain the current 20 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31524 Darlington Replace Powerhouse Roof	15210000 Nuclear – Roofing	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
79148 Darlington Fire Protection Phase III	15701000 Nuclear – Service Water & Fire Protection System	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83053 Darlington Power House Upper Level Service Water Piping Replacement	15701000 Nuclear - Service Water & Fire Protection System	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83530 Darlington Power House Upper Level Service Water Piping Replacement – Unit 2	15701000 Nuclear - Service Water & Fire Protection System	Retain the current 25 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
80144 Darlington Primary Heat Transport Motor - Overhaul	15991200 Nuclear – Large Motors - with more than 200Hp	Retain the current 30 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33293 Darlington Main Control Room HVAC Upgrade	15720000 Nuclear – Common Service Systems	Retain the current 35 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.

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33631 Darlington Chiller Replacement to Reduce CFC Emissions	15720000 Nuclear – Common Service Systems	Retain the current 35 year service life based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
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Based on the book values of the affected classes, the above recommendations are expected to decrease the annual depreciation expense by approximately \$0.6 million, effective January 1, 2024.

Summary of Impact

Based on the book values of the affected classes, all of the above recommendations are expected to decrease the annual depreciation expense for the nuclear business by a total of approximately \$86 million, excluding asset retirement costs. Before adjustments to the asset retirement costs recorded as of December 31, 2023, their annual depreciation expense is expected to decrease by approximately \$42 million as a result of the above recommendations. The changes to the asset lives would be effective January 1, 2024.

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2023 Depreciation Review Committee Recommendations – Nuclear

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
Steve Gregoris	Chief Nuclear Officer
Aida Cipolla	Chief Financial Officer
Brenda MacDonald	Chief Commercial Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Senior Vice President, Chief Controller & Accounting Officer
Promita Datta	Director, External Reporting and Accounting Policy
Matthew Kirk	Director, Ontario Regulatory Affairs
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Garry Lam	Senior Manager, Investment Management, Nuclear Finance

The Key Technical Contacts are:

Name	Position
Soheil Zahabi	Senior Advisor, Investment Management, Nuclear Finance

MEMORANDUM

2023 Depreciation Review Committee Recommendations – Nuclear

Appendix A – Assets of Pickering Units 5 to 8 Expected to be Replaced through Refurbishment

The following net book values in the associated asset classes have been identified by the DRC as being expected to be replaced through the planned refurbishment of Units 5 to 8 at Pickering, based on the proposed refurbishment scope for major components and operational experience.


Asset Class #	Asset Class Name	Dec. 31, 2023 Net Book Value (\$M)
15200000	Nuclear - Buildings and Structures	0.0
15340000	Nuclear - Process Systems	2.6
15400000	Nuclear- Turbines, Auxiliary Equipment, Steam Reheater Tubes	1.8
15500000	Nuclear - Main Power Output System	3.8
15511000	Nuclear - Station Service Main Transformers and AC Power Distribution System	0.0
15560000	Nuclear - AC Standby Power	0.3
15561000	Nuclear- AC Standby Power	2.4
15701000	Nuclear - Service Water & Fire Protection System	1.4
15710000	Nuclear - Water Treatment Plant	0.0
15711000	Nuclear - Circulating Water	0.0
15720000	Nuclear - Common Service Systems	1.0
	TOTAL	13.4

MEMORANDUM

2022 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2022 Depreciation Review Committee Recommendations for Nuclear Regulated facilities is requested.

Submitted by:



Chessa Jope – Director, External Reporting and Accounting Policy

March 29, 2023

Date

Approved by:



Steve Gregoris – Chief Nuclear Officer

March 30, 2023

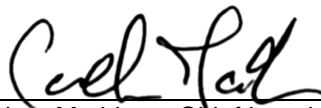
Date



Aida Cipolla – Chief Financial Officer and Senior Vice President, Finance

March 30, 2023

Date



Carlton Mathias – Chief Legal, ESG and Governance Officer

March 31, 2023

Date

2022

DEPRECIATION REVIEW COMMITTEE
RECOMMENDATIONS

FOR

NUCLEAR

MARCH 2023

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2022 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/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 is considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG's depreciation rates 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, "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. 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."¹

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the nuclear business was performed by Concentric in 2020. Concentric's report on OPG's depreciation rates dated December 28, 2020 was submitted to the OEB as part of OPG's application for 2022-2026 payments amounts, and its results were reflected in the OEB-approved settlement agreement on the application. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the nuclear assets in 2021. This report is the second year of the five-year cycle.

SCOPE OF 2022 DRC REVIEW FOR NUCLEAR

Station Service Lives

On September 29, 2022, the Province announced its support for the continued safe operation of the Pickering GS, which includes Units 1 and 4 operating to the end of September 2024 and December 2024, respectively, and Units 5 to 8 operating until the end of September 2026. OPG had previously planned to operate Units 5 to 8 until the end of 2025. OPG has completed an analysis which demonstrates that further optimization of the end of operations dates for the Pickering station's units is safe, technically feasible and would result in incremental economic and other benefits to the province and to OPG. The Province has also asked OPG to perform an update to its feasibility assessment for the redevelopment of Units 5 to 8 at the Pickering GS, based on current information, as a prudent due diligence measure to support future electricity planning decisions. Operating any of the Pickering units past December 31, 2024 is subject to regulatory

¹ Concentric reached a similar conclusion with respect to OPG's depreciation review practice in its report on OPG's depreciation rates dated December 28, 2020.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

approval by the Canadian Nuclear Safety Commission (CNSC) through a public hearing process. Pickering station end-of-life (EOL) dates for accounting purposes were extended from December 31, 2022 for Units 1 and 4 to September 2024 and December 2024, respectively, through the 2020 DRC process. The 2022 DRC assessed whether the current status of the optimization plan indicates that sufficient high confidence has been achieved to extend EOL dates for Pickering Units 5-8 beyond December 31, 2024.

Asset Class Review

Six in-service nuclear major fixed asset classes were selected for the 2022 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in 2021 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
15340000 – Nuclear – Process Systems
15411100 – Nuclear – Turbine Auxiliary Equipment, Steam Reheater Tubes – Pickering B and Darlington
15561000 – Nuclear – AC Standby Power – Pickering B and Darlington
15600000 – Nuclear – Instrumentation and Control
15700000 – Nuclear – Circulating Water Pickering A and Bruce
15991200 – Nuclear – Large Motors – with more than 200 HP

Excluding asset retirement costs and other asset classes with services lives tied directly to the overall station service lives, approximately 52% of the total in-service net book value of the fixed asset classes of the nuclear business as at December 31, 2022 were studied in the 2022 DRC review. Combined with the 2021 DRC review, 65% of such total in-service fixed assets of in the nuclear business now have been covered. 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.

Darlington Refurbishment

With the refurbishment of Darlington’s Unit 2 completed in June 2020, the DRC initiated a process to identify and review any significant existing Darlington assets that were placed in-service prior to refurbishment, with remaining service lives shorter than the 30-year post-refurbishment life assumption of the Units. The objective of this process is to confirm that the depreciation periods for those existing Darlington assets expected to support the post refurbishment life remain appropriately aligned. In 2021, this review focused on Unit 2 where a selection of significant assets and projects with remaining service lives approaching the 30-year post-refurbishment life assumption for the Darlington reactors was studied. In 2022, this review was expanded to the remaining Darlington Units where a selection of significant assets and projects with remaining service lives approaching the 30-year post-refurbishment life assumption was studied. The selections comprised twenty-three projects within asset class 156000000 (Instrumentation and Control) and seven projects within asset class 157010000 (Service Water & Fire Protection System). The remaining significant Darlington assets will be reviewed in future years within the DRC mandate.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

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;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Station Service Lives Review

The DRC does not recommend changes to the estimated useful life of Pickering Units 5-8. Regulatory work in support of obtaining the CNSC’s approval for operating Pickering Units 5-8 to September 2026 is in progress. Based on the status of this work, the 2022 DRC concluded that OPG does not yet have the requisite high confidence to extend the EOL dates beyond the current approved dates. The DRC also confirmed that no new information became available in 2022 that would justify a change in the station EOL dates of the Darlington, Bruce A or Bruce B nuclear stations.

The following average nuclear station EOL dates are recommended to remain effective from December 31, 2022.

Darlington	December 31, 2052
Pickering Units 1	September 30, 2024
Pickering Units 4	December 31, 2024
Pickering Units 5-8	December 31, 2024
Bruce A	December 31, 2052
Bruce B	December 31, 2061

Asset Class Review

A summary of the conclusions from the 2022 DRC review of the average service lives of the nuclear asset classes is outlined below:

Asset Class	Recommendation
15340000 – Nuclear – Process Systems	Retain the current 55 years average service life
15411100 – Nuclear – Turbine Auxiliary Equipment, Steam Reheater Tubes – Pickering B and Darlington	Retain the current 55 years average service life
15561000 – Nuclear – AC Standby Power – Pickering B and Darlington	Retain the current 55 years average service life
15600000 – Nuclear – Instrumentation and Control	Retain the current 15 years average service life
15700000 – Nuclear – Circulating Water Pickering A and Bruce	Retain the current 40 years average service life
15991200 – Nuclear – Large Motors – with more than 200 HP	Retain the current 30 years average service life

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

Darlington Refurbishment

A summary of the conclusions from the internal study of the significant existing Darlington assets placed in-service prior to refurbishment with remaining service lives shorter than the 30-year post-refurbishment life assumption for the reactors is outlined below:

Project and Asset Name	Asset Class	Recommendation and Summary Rationale
33623 Darlington Partial Discharge Monitoring Project	156000000 – Nuclear - Instrumentation and Control	Extend service life based on operating expectations from technical testing completed, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
31426 Darlington Fuel Handling Inverter Replacement	156000000 – Nuclear - Instrumentation and Control	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
31534 Darlington Reactor Regulating System Logic Module Redesign	156000000 – Nuclear - Instrumentation and Control	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
33228 Darlington Hydrogen Cooling Redesign	156000000 – Nuclear - Instrumentation and Control	Extend service life based on operating expectations and preventative maintenance programs in place, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
33819 Darlington Turbine Generator Vibration Monitoring System Replacement	156000000 – Nuclear - Instrumentation and Control	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
34000 Darlington Auxiliary Heating Steam Facility	156000000 – Nuclear - Instrumentation and Control	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 15 years.
31420 Darlington Dyer Programmed Logic Controller Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31432 Darlington Containment Box-Up Monitor Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33973 Standby Generator Control Retrofit	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

33977 Darlington Digital Control Computer Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33955 Darlington Shutdown System Computers Aging Management	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
80022 Darlington OH180 Aging Management Hardware Installation	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33815 Darlington Fuel Handling Computer Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
80124 Darlington Obsolete Controller Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31544 Darlington Radiation Detection Obsolescence	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31526 Darlington Feeder Scanner Refurbishment	156000000 – Nuclear – Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83828 Establish Monitoring & Diagnostic Centre	156000000 – Nuclear – Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31436 Computer Upgrade for Heavy Water Management System	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33904 Darlington Plant Information System Addition to Main Control Room	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

33445 Darlington Gaseous Fission Product Monitoring System Replacement	156000000 – Nuclear – Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
33509 Darlington Computer Components Replacement	156000000 – Nuclear – Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31416 Darlington Automated Gamma Monitoring System	156000000 – Nuclear – Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
80113 Darlington Liquid Zone Control Valve Replacement	156000000 – Nuclear - Instrumentation and Control	Retain the current 15 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
31518 Darlington Restore Emergency Service Water and Firewater Margins	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.
33239 Darlington Alternative Water Supply to Shutdown Coolant / Primary Heat Transport Pump Motors	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.
33909 Darlington Municipal Industrial Strategy for Abatement of Building Effluent	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.
38948 Darlington Zebra Mussel Mitigation improvements	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.
79016 Darlington Fire Protection Phase 2	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

80151 Darlington Fire Hazzard Assessment and Fire Safe Shutdown Analysis Modifications	15701000 Nuclear – Service Water & Fire Protection System	Align average service life with the assumed end of life of refurbished Darlington reactors, based on current lifecycle management plans, by transferring into a new asset class with a service life of 55 years, from the current 25 years.
31552 Darlington Condenser Cooling Water Low Pressure Service Water Travelling Screen Replacement	15701000 Nuclear – Service Water & Fire Protection System	Retain the current 25 year service life of the asset based on current lifecycle management plans. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.

Summary of Impact

Based on the book values of the affected classes, the above recommendations are expected to decrease the annual depreciation expense for the nuclear business by a total of approximately \$5.4 million. The changes to the asset lives would be effective January 1, 2023.

MEMORANDUM

2022 Depreciation Review Committee Recommendations – Nuclear

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
Steve Gregoris	Chief Nuclear Officer
Aida Cipolla	Chief Financial Officer and Senior Vice President, Finance
Carlton Mathias	Chief Legal, ESG and Governance Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Vice President, Chief Controller & Accounting Officer
Chessa Jope	Director, External Reporting and Accounting Policy
Matthew Kirk	Senior Manager, Ontario Regulatory Affairs
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Garry Lam	Senior Manager, Investment Management, Nuclear Finance

The Key Technical Contacts are:

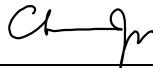
Name	Position
Soheil Zahabi	Senior Advisor, Investment Management, Nuclear Finance

MEMORANDUM

2021 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2021 Depreciation Review Committee Recommendations for Nuclear Regulated facilities is requested.

Submitted by:



Chessa Jope – Director, External Reporting and Accounting Policy

March 14, 2022

Date

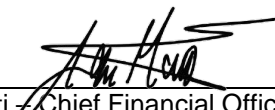
Approved by:



Steve Gregoris – Chief Nuclear Officer

March 14, 2022

Date



John Mauti – Chief Financial Officer and Senior Vice President, Finance

March 14, 2022

Date



Shelley Babin – Chief Legal and Ethics Officer

March 14, 2022

Date

2021

DEPRECIATION REVIEW COMMITTEE
RECOMMENDATIONS

FOR

NUCLEAR

MARCH 2022

MEMORANDUM

2021 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2021 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/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 is considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG's depreciation rates 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, "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. 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."¹

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the nuclear business was performed by Concentric in 2020. To create alignment with the external review and assessment completed, the DRC restarted the five year review cycle for the nuclear assets in 2021, with a selection of the remaining asset classes from the previous cycle reviewed in 2021 as the first year of the new five year period. Concentric's report on OPG's depreciation rates dated December 28, 2020 was submitted to the OEB as part of OPG's application for 2022-2026 payments amounts, and its results were reflected in the OEB-approved settlement agreement on the application.

SCOPE OF 2021 DRC REVIEW FOR NUCLEAR

Station Service Lives

OPG has completed an analysis which demonstrated that further optimization of the end of operations dates for the Pickering station's units is safe, technically feasible and would result in incremental economic and other benefits to the province and to OPG. Under OPG's plan, Pickering Units 1 and 4 would operate to the end of September 2024 and December 2024, respectively, and Pickering Units 5-8 would operate until the end of 2025. The optimization plan has been approved by OPG's Board of Directors and endorsed by the Province of Ontario. Operating any of the Pickering units past December 31, 2024 is subject to regulatory approval by the Canadian Nuclear Safety Commission (CNSC) through a public hearing process. Pickering station end-of-life (EOL) dates for accounting purposes were extended from December 31, 2022 for Units 1 and 4 to September 2024 and December 2024, respectively, through the 2020 DRC process. The 2021

¹ Concentric reached a similar conclusion with respect to OPG's depreciation review practice in its report on OPG's depreciation rates dated December 28, 2020.

MEMORANDUM

2021 Depreciation Review Committee Recommendations – Nuclear

DRC assessed whether the current status of the optimization plan indicates that sufficient high confidence has been achieved to extend EOL dates for Pickering Units 5-8 beyond December 31, 2024.

Asset Class Review

Eleven in-service Major fixed asset classes were selected for the 2021 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5M) that had not been reviewed by the DRC in the previous 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
15200000 – Nuclear - Buildings and Structures
15210000 – Nuclear - Roofing
15330000 – Nuclear - Reactivity Control Units
15351100 – Nuclear - Steam Generator – Pickering B and Darlington
15411000 – Nuclear - Turbines Blades and Diaphragms (Pickering)
15412000 – Nuclear - Turbines Blades and Diaphragms (Darlington)
15421000 – Nuclear - Generator Rotors, Stators and Auxiliary systems - Pickering B and Darlington
15500000 – Nuclear - Main Power Output Systems
15521000 – Nuclear - Station Service Main Transformation and Power Distribution System
15551000 – Nuclear - Reactor Building Cabling – Pickering B and Darlington
15560000 – Nuclear - AC Standby Power – Pickering A and Bruce

Excluding asset retirement costs and other asset classes with services lives tied directly to the overall station service lives, approximately 14% of the total in-service net book value of the fixed asset classes of the nuclear business as at December 31, 2021 were studied in the 2021 DRC review. 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.

Darlington Refurbishment

With the refurbishment of Darlington’s Unit 2 completed in June 2020, the DRC initiated a process to identify and review any significant existing Darlington assets placed in-service prior to refurbishment with remaining service lives shorter than the 30-year post-refurbishment life assumption of the Units. The objective of this process is to confirm that the depreciation periods for those existing Darlington assets expected to support the post refurbishment life remain appropriately aligned. In 2021, this review focused on Unit 2 where a selection of significant assets and projects with remaining service lives approaching the 30-year post-refurbishment life assumption for the Darlington reactors was studied. The remaining significant Darlington assets will be reviewed in future years within the DRC mandate.

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;
- industry experience; and

MEMORANDUM

2021 Depreciation Review Committee Recommendations – Nuclear

- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Station Service Lives Review

The DRC does not recommend changes to the estimated useful life of Pickering Units 5-8. Regulatory work in support of obtaining the CNSC’s approval for operating Pickering Units 5-8 to the end of 2025 is in progress. Based on the status of this work, the 2021 DRC concluded that OPG does not yet have the requisite high confidence to extend the EOL dates beyond the current approved dates. The DRC also confirmed that no new information became available in 2021 that would justify a change in the station EOL dates of the Darlington, Bruce A or Bruce B nuclear stations.

The following average nuclear station EOL dates are recommended to remain effective from December 31, 2021.

Darlington	December 31, 2052
Pickering Units 1	September 30, 2024
Pickering Units 4	December 31, 2024
Pickering Units 5-8	December 31, 2024
Bruce A	December 31, 2052
Bruce B	December 31, 2061

Asset Class Review

A summary of the conclusions from the 2021 DRC review of the average service lives of the nuclear asset classes is outlined below:

Asset Class	Recommendation
15200000 – Nuclear - Buildings and Structures	Retain the current 55 years average service life
15210000 – Nuclear - Roofing	Retain the current 25 years average service life
15330000 – Nuclear - Reactivity Control Units	Retain the current 40 years average service life
15351100 – Nuclear - Steam Generator – Pickering B and Darlington	Retain the current 30 years average service life
15411000 – Nuclear - Turbines Blades and Diaphragms (Pickering)	Retain the current 15 years average service life
15412000 – Nuclear - Turbines Blades and Diaphragms (Darlington)	Retain the current 30 years average service life
15421000 – Nuclear - Generator Rotors, Stators and Auxiliary systems - Pickering B and Darlington	Retain the current 55 years average service life
15500000 – Nuclear - Main Power Output Systems	Retain the current 35 years average service life
15521000 – Nuclear - Station Service Main Transformation and Power Distribution System	Retain the current 20 years average service life
15551000 – Nuclear - Reactor Building Cabling – Pickering B and Darlington	Retain the current 55 years average service life

MEMORANDUM

2021 Depreciation Review Committee Recommendations – Nuclear

15560000 – Nuclear - Standby AC Power – Pickering A and Bruce	Retain the current 40 years average service life
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Darlington Refurbishment

A summary of the conclusions from the internal study of the significant existing Darlington assets placed in-service prior to refurbishment with remaining service lives shorter than the 30-year post-refurbishment life assumption for the reactors is outlined below:

Project and Asset Name	Recommendation and Summary Rationale
31710 Darlington Shutdown Cooling Heat Exchanger Replacement	Extend service life based on operating expectations of the enhanced heat exchangers installed, by transferring into a new asset class with a service life of 40 years, from the current 30 years.
73566 Darlington Primary Heat Transport Pump Motor Replacements	Retain the current 30 years average service life. The timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83053 Darlington Powerhouse Upper Level Service Water Piping Replacement	Retain the current 30 years average service life. Timing and strategy of any intervention prior to Darlington reactor end of life will be evaluated over time based on asset condition.
83049 Darlington Copper Piping Replacement	Extend service life based on operating expectations of upgraded materials, by transferring into a new asset class with a service life of 40 years, from the current 25 years.
83284 Darlington New Fuel Load (Half Charge)	Align average service life of Darlington fuel load half charge asset class (15340900) with the assumed end of life of refurbished Darlington reactors (30 years) from the current 25 years. ²

Summary of Impact

Based on the book values of the affected classes, all of the above recommendations are expected to decrease the annual depreciation expense for the nuclear business by a total of approximately \$0.9 million. The changes to the asset class lives would be effective January 1, 2022.

² Asset class is comprised entirely of amounts related to the new fuel loaded as part of returning Unit 2 to service in 2020.

MEMORANDUM

2021 Depreciation Review Committee Recommendations – Nuclear

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
Steve Gregoris	Chief Nuclear Officer
John Mauti	Chief Financial Officer and Senior Vice President, Finance
Shelley Babin	Chief Legal and Ethics Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Vice President, Chief Controller & Accounting Officer
Chessa Jope	Director, External Reporting and Accounting Policy
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Matthew Kirk	Senior Manager, Ontario Regulatory Affairs
Angelo Pavia	Senior Manager, Strategic Initiatives, Asset Management

The Key Technical Contacts are:

Name	Position
Prasenjit Roy	Senior Advisor, Investment Management, Nuclear Finance

MEMORANDUM

2020 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2020 Depreciation Review Committee Recommendations for Nuclear Regulated facilities is requested.

Submitted by:



Philip Ho – Director, External Reporting and Accounting Policy

March 24, 2021
Date

Approved by:



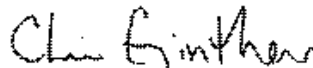
Sean Granville – Chief Operations Officer & Chief Nuclear Officer

29-March-2021
Date



John Mauti – Chief Financial Officer and Senior Vice President Finance

March 25, 2021
Date



Chris Ginther – Chief Administrative Officer

March 29, 2021
Date

2020

DEPRECIATION REVIEW COMMITTEE

RECOMMENDATIONS

FOR

NUCLEAR

MARCH 2021

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2020 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 is considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG's depreciation rates 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."¹

This is the third year of the DRC's current five year review period. Additionally, OPG engaged Concentric as an external consultant to perform an independent review and assessment of the asset service life estimates for OPG's prescribed nuclear facilities based on the net book values as at December 31, 2019 to supplement the DRC process, as expected by the OEB. Concentric's report, dated December 28, 2020, has been submitted to the OEB as part of OPG's application for payment amounts effective January 1, 2022. The results of Concentric's review are summarized in this memorandum.

SCOPE OF 2020 DRC REVIEW FOR NUCLEAR

Station Service Lives Review

OPG has completed an analysis which demonstrated that further optimization of the end of operations dates for the Pickering station's units is safe, technically feasible and would result in incremental economic and other benefits to the province and to OPG. Under OPG's plan, Pickering Units 1 and 4 would operate to the end of September 2024 and December 2024, respectively, and Pickering Units 5-8 would operate until the end of 2025. In August 2020, the Province of Ontario (Province) announced its support for OPG's optimized shutdown plan. Operating any of the Pickering units past December 31, 2024 is subject to CNSC regulatory approval through a public hearing process. The 2020 DRC assessed whether the current status of the optimization plan and other factors indicates that sufficient high confidence has been achieved to extend accounting end-of-life (EOL) dates for the station.

¹ Concentric reached a similar conclusion with respect to OPG's depreciation review practice in its report on OPG's depreciation rates dated December 28, 2020.

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

The 2020 DRC also considered whether it was aware of any evidence justifying a change in the estimated service lives of the Darlington, Bruce A or Bruce B stations.

Asset Class Review

Ten in-service Major fixed asset classes were selected for the 2020 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of 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 selection also considered asset classes that previously had a zero net book value but which were expected to be in use, for material components, following return to service of Darlington’s Unit 2 from refurbishment. With the return to service of Darlington’s Unit 2 from refurbishment during 2020, the DRC also considered the need to establish any new asset classes as part of placing Unit 2 capital amounts in service.

The asset classes selected for review were as follows:

Asset Class
15000110 – Nuclear Intangibles (Pickering B and Darlington)
15110000 – Nuclear Site Improvements
15120000 – Nuclear Yard Facilities
15314000 – Fuel Channel Assemblies (Pickering B and Darlington)
15323000 – Calandria Tubes (Pickering B and Darlington)
15361000 – Nuclear Irradiated Fuel Bays (Pickering B and Darlington)
15511000 – Nuclear Station Main Transformers (Pickering B and Darlington)
15531000 – Nuclear Building Electrical Service (Pickering B and Darlington)
15720000 – Nuclear Common Service Systems
16210000 – Admin & Services Building Improvements

Excluding asset retirement costs and other asset classes with services lives tied directly to the overall station service lives, approximately 89% of the total in-service net book value of the fixed and intangible asset classes of the nuclear business as at December 31, 2020 have been covered by the 2018, 2019 and 2020 DRC reviews.

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;
- reviews of Darlington Refurbishment work components conducted by refurbishment project managers;
- information obtained from past DRC reviews;
- industry experience; and
- internal consistency of service life estimates.

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

SUMMARY OF RECOMMENDATIONS

Station Service Lives Review

As discussed below, the DRC recommends an extension of the Pickering station EOL dates for accounting purposes from December 31, 2022 for Units 1 and 4 to September 30, 2024 and December 31, 2024, respectively. The DRC does not recommend any changes to the current station EOL date for Units 5-8 of the Pickering station. There is also no recommendation for changes to the current station EOL dates for Darlington, Bruce A and Bruce B stations as no information has come to the DRC’s attention to justify such a change.

The following average nuclear station EOL dates are recommended to be effective from December 31, 2020.

Darlington	December 31, 2052
Pickering Unit 1	September 30, 2024
Pickering Unit 4	December 31, 2024
Pickering Units 5-8	December 31, 2024
Bruce A	December 31, 2052
Bruce B	December 31, 2061

The recommendation to change Pickering Units 1 and 4’s EOL dates aligns with OPG’s optimized shutdown plan for the station and does not require further approval from the CNSC. The recommendation is based on the high technical confidence related to the ongoing continued fitness-for-service of major components, including certain steam generators at Unit 4, achieved through inspection and analysis work. The DRC received confirmation of the high technical confidence that Units 1 and 4 can be safely and effectively operated to the end of 2024 in the fourth quarter of 2020.

As it did in 2019, the 2020 DRC also considered whether it was appropriate to extend the accounting EOL dates for Pickering Units 5-8 to 2025 based on the optimized shutdown plan. Although the optimized plan has been approved by OPG and endorsed by the Province, the DRC concluded that OPG does not yet have the requisite high confidence to extend the EOL dates beyond the current approved dates. This recommendation is based on the status of regulatory work in support of obtaining CNSC’s regulatory approval necessary for operation of the station beyond December 31, 2024, and the status of the associated technical work to confirm fitness-for-service of major station components and validity of the established Periodic Safety Review and Integrated Implementation Plan.

The change to the accounting EOL date for Units 1 and 4 is expected to have the following illustrative estimated impacts on depreciation expense based on actual asset values as of December 31, 2020 (i.e. including neither the impact of the year-end 2020 adjustment to the asset retirement obligation (ARO) estimate and asset retirement costs (ARC), nor future capital additions).

(\$M)	2021	2022	2023	2024
Estimated Pickering Depreciation Expense Change Based on December 31, 2020 Asset Values	-52	-52	54	50

As part of its application to the OEB for payment amounts effective January 1, 2022, OPG requested approval to establish a deferral account to record the revenue requirement impact of the year-end 2020

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

adjustment to ARO/ARC as well as the ongoing depreciation and amortization expense beginning January 1, 2021 resulting from the above changes in Pickering units' EOL dates, as well as any subsequent changes to the Pickering station EOL dates. In January 2021, the OEB issue an order effective January 1, 2021, approving the establishment of the requested account on an interim basis pending a final determination on OPG's payment amounts application.

Asset Class Review

A summary of the conclusions from the internal 2020 DRC review of the average service lives of the nuclear asset classes are outlined below:

Asset Class	Recommendation
15000110 – Nuclear Intangibles (Pickering B and Darlington)	Retain the current 55 years average service life
15110000 – Nuclear Site Improvements	Retain the current 75 years average service life
15120000 – Nuclear Yard Facilities	Retain the current 50 years average service life
15314000 – Fuel Channel Assemblies (Pickering B and Darlington)	Align average service life with the assumed end of life of refurbished Darlington reactors (30 years) from the current 28 years ²
15323000 – Calandria Tubes (Pickering B and Darlington)	Align average service life with the assumed end of life of refurbished Darlington reactors (30 years) from the current 28 years ²
15361000 – Nuclear Irradiated Fuel Bays (Pickering B and Darlington)	Retain the current 65 years average service life
15511000 – Nuclear Station Main Transformers (Pickering B and Darlington)	Retain the current 55 years average service life
15531000 – Nuclear Building Electrical Service (Pickering B and Darlington)	Retain the current 55 years average service life
15720000 – Nuclear Common Service Systems	Retain the current 35 years average service life
16210000 – Admin & Services Building Improvements	Retain the current 50 years average service life

For the asset classes with identified difference, the primary rationale for the change was as follows:

Asset Class	Summary of reason for change
15314000 – Fuel Channel Assemblies (Pickering B and Darlington)	As this is a life limiting component, the service life of these assets should extend to the end of life assumptions of the applicable stations
15323000 – Calandria Tubes (Pickering B and Darlington)	As this is a life limiting component, the service life of these assets should extend to the end of life assumptions of the applicable stations

Additionally, the DRC recommends establishing the following two new asset classes for certain components placed in service as part of Unit 2 refurbishment at the Darlington station, each with a 30-year service life.

² These asset classes are currently in use only for Darlington refurbishment assets and had a zero net book value prior to Darlington's Unit 2 refurbishment capital being placed in service in 2020.

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

Asset Class	Summary of rationale
Instrumentation and Control – Darlington Refurbishment	Components replaced during refurbishment are expected to be in operation for the full post-refurbishment lifespan of the station
Service Water and Fire Protection System – Darlington Refurbishment	Components replaced during refurbishment are expected to be in operation for the full post-refurbishment lifespan of the station

Additionally, as planned, the DRC has initiated a process to identify and as necessary review any significant existing Darlington assets prior to refurbishment with remaining service lives shorter than the 30-year post-refurbishment life assumption of the Units. The objective of this process is to confirm that the depreciation periods for those existing Darlington assets expected to support the post refurbishment life remain appropriately aligned. The detailed review is expected to be conducted as part of the 2021 DRC mandate.

Results of External Review

In addition to the annual internal DRC review, Concentric was engaged to review depreciation rates and generating station lives for the regulated nuclear facilities based on December 31, 2019 net book values of fixed and intangible assets, as well as assets placed in service upon return to service of Darlington’s Unit 2 in June 2020.

Concentric's review identified additional recommendations for changes in asset service lives. These are summarized in the table below, with further detail provided in Concentric's report. With the exception of these recommendations, Concentric concurred with OPG's current average service lives for the nuclear asset classes and average station EOL dates for the nuclear stations, including the above noted changes from the internal 2020 DRC review. Concentric also concurred with the depreciation rates for the capital amounts placed in service upon completion of Unit 2 refurbishment.

Asset Class	Recommendation
15352000 – Nuclear Generation Plant – Shutdown Cooling Exchangers – Pickering	Change the average service life from 25 to 30 years.
15530000 – Nuclear Generation Plant – Building Electrical Service Supply – Pickering A and Bruce	Change the average service life from 40 years to 55 years.

The above changes were recommended by Concentric to align the average service lives of the asset classes for the Pickering facilities with the equivalent asset classes for the Darlington station. These recommendations were reviewed and accepted by OPG’s technical contacts and the DRC and were adopted for the purposes of the 2020 DRC recommendations. The changes are expected to have a minimal to no impact on depreciation expense due to the assets being depreciated over the lesser of the asset class life and to the Pickering station EOL dates.

MEMORANDUM

2020 Depreciation Review Committee Recommendations – Nuclear

Summary of Impact

Based on the book values of the affected classes, all of the above recommendations are expected to decrease the annual depreciation expense for the nuclear business by a total of approximately \$5 million. The changes to the asset class lives would be effective January 1, 2021.

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
Sean Granville	Chief Operations Officer & Chief Nuclear Officer
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
Philip Ho	Director, External Reporting and Accounting Policy
Harvey Hui	Senior Manager, Corporate Accounting and Policy
Nadira Singh	Vice President, Business Planning and Reporting
Matthew Kirk	Senior Manager, 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
Derek Kindlon	Senior Manager, Major Nuclear Projects (Refurbishment)



ASSESSMENT OF REGULATED HYDROELECTRIC ASSET DEPRECIATION RATES

November 2025

Prepared for Ontario Power Generation

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Concentric Advisors, ULC
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November 27, 2025

Ontario Power Generation
700 University Avenue
Toronto, ON M5G 1X6

Attention: Herman Mo
Senior Manager, Regulatory Affairs

Dear Mr. Mo;

Pursuant to your request, we conducted a review and assessment of the regulated life estimates related to the Ontario Power Generation hydroelectric generation plant assets as of December 31, 2024. Our report presents a description of review undertaken by Concentric as well as our recommendations for a small number of revisions to the average service life estimates.

We gratefully acknowledge the assistance of Ontario Power Generation personnel in the completion of the review.

Should you have any questions or concerns, please do not hesitate to contact me directly at 587.997.6489

Yours truly,

Concentric Advisors, ULC

Amanda Nori
Assistant Vice President

ARN/ta
Project: 100527



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SECTION 1

1 BASIS OF STUDY

1.1 Scope

Concentric Advisors, ULC (“Concentric” or “Concentric Advisors”) has been retained by Ontario Power Generation (“OPG”) to review the average service life estimates of its regulated hydroelectric generation plant assets based on December 31, 2024 asset values. This report sets forth the findings of our independent review.

The average service life estimates recommended in this report are considered in OPG’s depreciation review process in establishing the asset depreciation rates and generating station lives for the Property, Plant and Equipment (“PP&E”) of OPG’s prescribed facilities, including directly assigned corporate PP&E balances. As the depreciation and amortization expense for regulated revenue requirement purposes includes intangible assets, average service lives for intangible assets were also included in this analysis.

The facilities for which average service lives were analyzed consist of 54 hydroelectric stations, together with the associated other plant assets, prescribed for OEB rate regulation by *Ontario Regulation 53/05* under *Ontario Energy Board Act, 1998*. As part of this study, Concentric Advisors reviewed the operating considerations and typical station configurations of these 54 hydroelectric stations and notes from site tours taken in prior studies.

1.2 Background

In March 2007, Concentric Advisors (then operating as Gannett Fleming) submitted a report titled “Review of the Ontario Power Generation Inc. Depreciation Review Process” (the “2007 Report”). The 2007 Report presented a summary of the findings of an independent review of the processes, procedures and methods used by OPG to review its depreciation expense. The 2007 Report indicated that “Gannett Fleming has found that the processes, procedures and methods followed by Ontario Power Generation Inc. adequately meet regulatory objectives regarding depreciation generally accepted by Canadian regulatory authorities.”¹

Additionally, Gannett Fleming found that “OPG’s current Depreciation Review Process results in the depreciation expense component of the revenue requirement that reasonably and appropriately reflects the consumption of the average service life of OPG’s regulated assets. Gannett Fleming also views that, overall, the Depreciation Review Committee (“DRC”) process is adequate in meeting the generally accepted regulatory objectives regarding depreciation for regulated North American utilities.”² Overall, the 2007 Report concluded that the procedural foundation upon which OPG’s DRC had developed average service life estimates was robust and appropriate. The 2007 Report contributed, in part, to the Ontario Energy Board’s (“OEB”) acceptance of OPG’s depreciation expense in the EB-2010-0008 proceeding.

¹ Cover letter to the 2007 Report

² 2007 Report, page III-2.



Subsequently, Gannett Fleming was retained by OPG to complete independent comprehensive assessments of depreciation rates and generating station lives of OPG's prescribed hydroelectric and nuclear assets based on December 31, 2010, December 31, 2012 (and for the Niagara Tunnel placed in service in 2013), December 31, 2018 (prescribed hydroelectric only) and December 31, 2019 (prescribed nuclear only) asset values. The first two assessments were documented by Gannett Fleming in reports titled "Assessment of Regulated Asset Depreciation Rates and Generating Station Lives" dated December 16, 2011 ("2011 Report") and November 29, 2013 ("2013 Report"). The work completed in 2019 and 2020 was documented by Concentric Advisors in reports titled "Assessment of Regulated Hydroelectric Asset Depreciation Rates" dated December 2019 ("2019 Hydroelectric Report") and "Assessment of Regulated Nuclear Asset Depreciation Rates and Generating Station Lives" dated December 2020 ("2020 Nuclear Report").

The 2011 Report and the 2013 Report found that "the currently approved average service life estimates continued to be based on a procedurally sound and reasonable DRC process" and that "to a large extent, the work prepared over the past several years by the DRC continued to be a reliable information source."³ The 2019 Hydroelectric Report and the 2020 Nuclear Report similarly found the DRC process "to be procedurally sound, reasonable and resulting in valid depreciation rates and generating station lives that accurately reflect the consumption of average service life of OPG's regulated assets" and that "the work prepared by the DRC continues to be an overall reliable source of information in conducting the 2020 Depreciation Rate Assessment."⁴ Concentric also noted that OPG had continued to calculate depreciation rates using the Straight-Line method for virtually all plant comprising regulated assets, based on the Average Life Group Procedure – Whole Life Technique, , found that this "results in a reasonable recovery of OPG's capital investment over time" and recommended their continued application.⁵

As part of these previous reports, Gannett Fleming and Concentric reviewed the average service life estimates for each depreciable group and generating station lives based on their professional judgement, taking into consideration the results of the DRC process, the company's practices and outlook as they relate to plant operation, asset condition and retirement, the service life estimates of peer electric generation companies (as applicable), and the experience of Gannett Fleming and Concentric in selecting average service lives for similar plant. In adopting this approach to their assessment, it was noted that "[i]n the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed actuarial study of retirement history" and "[a]s such, a retirement rate analysis was not completed by Concentric Advisors."⁶ Each of the previous reports recommended a small number of revisions to the average service life estimates for OPG's regulated assets, which were adopted in full by OPG.

Previous reports also recommended that each "account should be subjected to a complete depreciation study which re-evaluates its average service life estimates periodically"⁷, noting "that

³ 2013 Report, page I-7

⁴ 2019 Hydroelectric Report, page 1-2 and similarly 2020 Nuclear Report, page 1-3

⁵ 2019 Hydroelectric Report, page 3-1 and similarly 2020 Nuclear Report, page 3-1

⁶ 2019 Hydroelectric Report, page 3-5 and similarly 2020 Nuclear Report, page 3-4

⁷ 2013 Report, page II-11



OPG's practice of reviewing its significant asset accounts and depreciation service lives over an approximate five-year cycle under the DRC process meet the recommended practice of continued surveillance to maintain the use of appropriate depreciation rates, when supplemented by a periodic comprehensive independent assessment."⁸

The 2011 Report and 2013 Report were filed with the OEB in OPG's 2014-2015 payment amounts proceeding (EB-2013-0321), in satisfaction of the OEB's direction regarding an independent depreciation study. In its EB-2013-0321 decision, the OEB accepted the results of the 2011 Report as updated by the 2013 Report for both nuclear and hydroelectric assets, including OPG's continued use of the average life group method to determine depreciation expense, and approved the depreciation expense as filed for inclusion in OPG's payment amounts.⁹

In line with the recommended cycle of approximately five years for a periodic depreciation study, no independent depreciation assessment was filed by OPG in EB-2016-0152. The 2020 Nuclear Report was filed with the OEB in OPG's 2022-2026 payment amounts proceeding, EB-2020-0290. In its EB-2020-0290 decision, the OEB approved a settlement proposal by OPG and intervening parties that, among other issues, accepted OPG's proposed depreciation service lives.¹⁰ OPG's hydroelectric base payment amount was not rebased in that proceeding and the 2019 Hydroelectric Report was not filed with the OEB at the time.

1.3 Summary of Results

Concentric has reviewed the DRC process and again finds it to be procedurally sound, reasonable and resulting in valid depreciation rates that accurately reflect the consumption of average service life of OPG's regulated assets. Overall, Concentric finds that the work prepared by the DRC continues to be a reliable source of information in conducting this 2024 Depreciation Rates Assessment.

Concentric also finds that OPG's practice of reviewing significant asset accounts and depreciation service lives over an approximate five-year cycle under the DRC process continues to meet the recommended practice of continued surveillance to maintain the use of appropriate depreciation rates, when supplemented by a periodic comprehensive independent assessment.

Concentric also finds OPG's continued use of the Straight-Line Method and the Average Life Group Procedure – Whole Life Technique to determine depreciation expense to be reasonable.

In reviewing depreciation rates for OPG's hydroelectric plant accounts, Concentric supports the average service lives currently in use, subject to recommended changes for the following accounts:

- Hydroelectric – Gates, Stoplogs and Operating Mechanisms: from 50 years to 45 years;
- Hydroelectric – Station Service Electrical Equipment: from 45 years to 40 years; and
- Hydroelectric – Electronic Security Systems: from 10 years to 20 years.

⁸ 2019 Hydroelectric Report, page 1-3 and similarly 2020 Nuclear Report, page 1-3

⁹ EB-2013-0321 Decision with Reasons, November 20, 2014, page 98

¹⁰ EB-2020-0290 Decision and Order, November 15, 2021, Schedule A, page 44



In reviewing depreciation rates for OPG's other plant accounts associated with the hydroelectric generating facilities, Concentric supports the average service lives currently in use, subject to recommended changes for the following accounts:

- Administrative and Service Buildings – Administrative Telecom Equipment: from 7 years to 10 years.



SECTION 2

2 PLAN OF STUDY

This study is presented in the following order:

Section 1:	Presents the Scope of the Study and provides background of prior study conclusions with a brief summary of the depreciation study results
Section 2:	Contains statements with respect to the plan and the basis of the study
Section 3:	Discusses development of average service life estimates, and presents descriptions of the methods used and factors considered in the service life study
Section 4:	Presents study results by depreciable group in Table 1

2.1 Information Provided by OPG

OPG has provided Concentric with required information, as of December 31, 2024, for all accounts being studied. This information has been compiled from the plant accounting records and includes the following:

- current balances by vintage year for each account (aged balances). The balances provide the amount of investment sorted by installation year currently in operation. This file is only inclusive of current plant in service and does not include any retirement information;
- Retirement transactions where available through December 31, 2024. The transactions include information regarding the transaction year of the retirement and the original cost of the asset being retired; and
- copies of the most recent DRC reviews for all regulated hydro plant asset accounts.

2.2 Procedures Performed

The above data was reviewed and reconciled to Company control schedules to ensure accuracy and reasonableness. These checks include that the surviving investment by account equals (or can be reconciled to) the Company's gross plant in service and accumulated depreciation ledger balances. In addition, Concentric performed the following procedures to form the basis of the results of this study:

- confirm accounting policies being followed in accordance with US generally accepted accounting principles;
- conduct interviews with OPG personnel to obtain and confirm understanding of hydroelectric plant operations;
- review of DRC recommendations and supporting documentation;
- review of prior working papers and supporting documents from the 2011 Report, the 2013 Report, and the 2019 Hydroelectric Report; and
- comparison against industry peers that operate facilities similar to OPG's regulated hydroelectric fleet.



SECTION 3

3 DEVELOPMENT OF DEPRECIATION RATES

3.1 Depreciation

Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities, and, in the case of electric companies, the exhaustion of natural resources.¹¹

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a time period by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing electric utility service. Normally, the time over which the fixed capital cost is allocated to the cost of service, is equal to the time over which an item renders service – that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the Straight-Line method of depreciation.

OPG continues to determine depreciation using the Straight-Line method for virtually all plant comprising regulated assets, based on the Average Life Group Procedure – Whole Life Technique. The Average Life Group Procedure is the most commonly used depreciation procedure for North American utilities, whereby one average service life estimate is applied to all assets and vintages within the asset class. The Whole Life Technique calculates depreciation on the basis of recovering the original cost of the investment over the entire life of an asset or group of assets with no provision for accumulated depreciation true-ups or depreciation rate adjustments. As such, a common life estimate is applied to each of the asset vintages, and each of the assets within each vintage. Concentric finds the application of the Straight-Line method and the Average Life Group Procedure – Whole Life Technique continues to result in a reasonable recovery of OPG's capital investment over time and recommends their continued application.

3.2 Estimation of Generating Asset Lives

3.2.1 Average Service Life

The use of an average service life for property groups that include large numbers of similar assets implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a life estimate that considers the retirements of units which survive at successive ages. As in the 2011 Report, 2013 Report and

¹¹ Federal Energy Regulatory Commission –Part 201- Uniform System of Accounts Prescribed for Electric Companies Subject to the Provisions of the Electric Act Definitions



the 2019 Hydroelectric Report, the average service life estimates in this study were reviewed by Concentric Advisors using judgment which considered a number of factors, including:

- Understanding of the processes used in the development of the currently used average service life estimates through the completion of the 2007 Report reviewing the DRC process and through the completion of the 2011 Report, 2013 Report and the 2019 Hydroelectric Report assessing the depreciation rates;
- Understanding of the assets currently in service through discussions with company staff, including representatives of the hydroelectric generation operating units;
- Review of notes from previous visits to hydroelectric generating sites;
- Review of current accounting practices and procedures applied and their consistency with those in place at the time of the 2019 Hydroelectric Report;
- Review of analyses provided to DRC, up to the results of the 2024 DRC process;
- Average service life estimates from other peer electric generation companies; and
- The general experience and professional judgment of Concentric Advisors.

3.2.2 Prior Assignments and Review of the DRC Process

As described in section 1.2, Concentric Advisors (then operating as Gannett Fleming) was previously retained in 2007 to review the practices and procedures used by the DRC to review depreciation expense, and, in 2011, 2013, 2019 and 2020, for the completion of depreciation studies for OPG's regulated assets. The 2007 review resulted in a report submitted to OPG management and filed by OPG in OEB proceeding EB-2007-0905. The 2013 depreciation study resulted in a report submitted to OPG management in 2013 and filed by OPG in OEB proceeding EB-2013-0321. The 2019 depreciation study resulted in a report submitted to OPG management. These prior reviews provided Concentric with an understanding of the type of generation plant in service at OPG, the processes used by OPG in the determination of service life estimates, and the OEB's regulatory oversight. In addition to updated information provided by OPG for this current review, Concentric considered information from these prior studies.

3.2.3 Operating Discussions and Site Tours

Discussions with operations representatives and the physical site tours undertaken as part of the prior studies provided Concentric with an understanding of the type of assets in service for hydroelectric service. The previous site tours provided Concentric Advisors with the necessary background to make an assessment of the physical installations of the OPG plant, and to understand the type of plant in service and the operating conditions of the facilities. Operational interviews were undertaken to understand the historic operating conditions that have led to retirement of plant in the past and to understand the current condition of the assets which may impact future retirement plans.

In conducting the 2013 and 2019 depreciation studies, Concentric had toured the following generation sites:



- Chats Falls Hydroelectric Generating Station;
- Arnprior Hydroelectric Generating Station;
- Stewartville Hydroelectric Generating Station;
- Calabogie Hydroelectric Generating Station;
- Barrett Chute Hydroelectric Generating Station;
- Chenaux Hydroelectric Generating Station;
- Des Joachims Hydroelectric Generating Station;
- Otto Holden Hydroelectric Generating Station;
- Bingham Chutte Hydroelectric Generating Station;
- Big Chute Hydroelectric Generating Station;
- Ragged Rapids Hydroelectric Generating Station;
- Hanna Chute Hydroelectric Generating Station;
- South Falls Hydroelectric Generating Station;
- Elliot Chute Hydroelectric Generating Station;
- Tretheway Falls Hydroelectric Generating Station; and
- Big Eddy Hydroelectric Generating Station;
- R.H. Saunders Hydroelectric Generating Station;
- Sir Adam Beck I and II Hydroelectric Generating Stations; and
- Ranney Falls Hydroelectric Generating Station¹².

Operational interviews covered the following topics, including, where applicable, inquiries regarding operating or other changes since the 2019 Hydroelectric Report:

- Operating history of various hydroelectric plant;
- Replacement history of major plant components and review of any significant retirement programs;
- General operating experience of the major plant components;
- Review of any life restricting operational issues;
- Review of any issues that have emerged during the DRC process;
- Review of instances where advancements in technology may cause changes to average service life indications; and

¹² Ranney Falls Hydroelectric Generating Station was undergoing a redevelopment project at the time of the physical site tour.



- Discussions of the manner in which OPG's hydroelectric plants may differ from hydroelectric generation plants.

3.2.4 Review of Accounting Policies

Concentric had discussions with finance management representatives during prior assignments to obtain and confirm understanding of OPG's depreciation and accounting policies and practices in accordance with United States Generally Accepted Accounting Principles ("US GAAP"). As part of the current assignment, Concentric confirmed with finance management representatives that there had been no changes to these policies and practices since the 2019 Hydroelectric Report, including as they relate to capitalization thresholds, asset retirement obligations and treatment of retirement transactions.¹³

3.2.5 Analysis and Results of DRC Reviews

The DRC has continued to complete detailed reviews of the average service life expectations for OPG's plant accounts. The DRC's technical reviews are conducted by internal experts in the specific areas associated with a number of accounts, leveraging operational and industry experience. As part of the current assignment and the previous reports, Concentric reviewed these analyses which provided significant background on the physical condition of the assets, a meaningful history of the manner in which plant assets have provided electric generation service over the past many years, and identified major upcoming replacement or retirement programs.

Since the completion of the 2019 Hydroelectric Report, the DRC completed a detailed review of the average service life expectations for plant accounts comprising approximately 85 % of the company's in-service investment in the regulated hydroelectric business.

3.2.6 Peer Analysis

In order to provide a comparison for each account grouping, Concentric selected a peer group of companies to use in the development of average service lives. The companies selected for comparison were all companies for which Concentric has recently completed depreciation studies relating to Canadian hydroelectric generation plants. As such, Concentric was able to make a meaningful comparison giving consideration to factors such as capitalization and retirement policies, maintenance practices, and general operational practices. The companies selected for comparison were:

- BC Hydro;
- Manitoba Hydro;
- New Brunswick Power

¹³ As previously noted in the 2013 Report (page II-7), OPG's accumulated depreciation accounts do not include embedded gains or losses from previous retirement transactions, as OPG books all such gains and losses to the income statement in the year of retirement in accordance with the provisions of US GAAP. As a result, there is no need to test the adequacy of accumulated depreciation balances. Concentric believes that the nature of the large plant components and small amount of retirement transactions continue to make this policy viable and reasonable for OPG.



- Newfoundland and Labrador Hydro

As noted in the 2011 Report, 2013 Report, and the 2019 Hydroelectric Report, OPG's hydroelectric asset classes lend themselves to comparison with these utilities due to the similar nature of the technology used in hydroelectric energy production. As such, the above utilities provided Concentric Advisors with a comparable base of average service life estimates to use in the development of the service life estimates for OPG's hydroelectric asset classes through Concentric's professional judgement.

3.2.7 Professional Judgement

The use of professional judgment in the development of average service life estimates is a practice that is appropriate and has been used for many years before North American regulatory jurisdictions. When available, the use of statistical analysis of the historic retirement transactions combined with the use of professional judgment, which includes physical site inspections, review of accounting procedures and practices, use of operational staff interviews, review of prior studies, and review of the approved life estimates of peer companies where applicable, provides the most complete method of service life analysis. However, the use of professional judgment alone also provides an appropriate basis for developing average service life estimates, when appropriate factors are considered, and has been accepted as a valuable depreciation analysis tool in many North American jurisdictions.

As previously noted by Concentric in the 2013 Report and the 2019 Hydroelectric Report, in the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed actuarial study of retirement history. As such, a retirement rate analysis was not completed by Concentric Advisors.

3.2.8 Life Span Dates

Life expectancy of electric generation plant assets is impacted not only by physical wear and tear of the assets but also by economic factors including the feasibility of the economic replacement of major operating components or the economic viability of the plant as a whole. In circumstances where the replacement of major operating components is not economically feasible, the life of the major component can be the determining factor of the generation plant and all of the assets within the plant. As such, the remaining depreciation life of electric generation plant assets is the lesser of the physical life expectation of the asset or the period to the end of the life span of the generation plant.

The use of life span dates for determining depreciable lives for regulated electric generation plant is common throughout many North American regulatory jurisdictions. The basis for the determination of the life span date is usually based on one or more of the following:

- the physical life estimation of the major and vital components of the generating plant;
- the duration of operating licenses;
- precedent and policy of the regulatory jurisdiction;
- expiration of the supply source for which the generation plant is dependent; and
- expiration of market demand upon which the generation plant is dependent.



OPG’s regulated hydroelectric stations do not require an end of life date as there are currently no factors reasonably expected to limit their life. With regular maintenance and replacement of components, hydroelectric stations, including associated civil structures, are typically expected to operate for very long periods.¹⁴ All sites currently in service or under redevelopment are expected to generate hydroelectric service for the foreseeable future and there is no plan to remove any of these sites.

3.3 Average Service Life Assessments

Concentric has reviewed the average service life estimates for all regulated hydroelectric generation plant and asset categories, based on December 31, 2024 asset values. The service life estimate recommendations were based on informed professional judgment which incorporated a review of management’s plans, policies and outlook, a general knowledge of the electric industry, and comparisons of the service life estimates from our studies of other peer electric companies.

Based on the review, Concentric supports continued use of the average service lives as set out in Section 4, Table 1 of this study. This represents OPG’s currently approved average service lives (inclusive of the results of the 2024 DRC process), with recommended changes to the life estimates of the following accounts.

ACCOUNT 10318000 – HYDROELECTRIC – GATES, STOPLOGS AND OPERATING MECHANISMS

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$673,206,384	50	45

The 2019 Hydroelectric Report recommended a 50-year average service life for this asset class. A peer comparison of Canadian hydroelectric generation utilities produced a range from 40 to 80 years. However, it is noted that the assets included in this account are not uniform across the peer utility group. As stoplogs have a shorter average service life than gates, it is expected that the inclusion of stoplogs in this account will have a life shortening impact as compared to the longest lived peers which account for stoplogs and gates in separate accounts. Gate refurbishments occur due to age and operational flexibility, indicating that a life on the shorter end of peer utilities may be appropriate. At this time, Concentric recommends shortening the life of this account to 45 years in recognition of the generally shorter lives in use by peer utilities.

ACCOUNT 1050500 – HYDROELECTRIC – STATION SERVICE ELECTRICAL EQUIPMENT

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$ 181,305,123	45	40

The 2019 Hydroelectric Report recommended a 45-year average service life for this asset class. A peer comparison of Canadian hydroelectric generation utilities produced a range from 25 to 50 years.

¹⁴ Although dams can be considered a life-limiting component for hydroelectric generating facilities, in practice this does not result in an establishment of a specific life span date as the dams are typically expected to be in use for the foreseeable future with regular maintenance.



The assets in this class receive ongoing advancements in electrical and control technologies. Concentric recommends shortening the life of this account to 40 years based on the results of the operational interviews and the shorter lives generally in use by peer utilities.

ACCOUNT 1072000 – HYDROELECTRIC – ELECTRONIC SECURITY SYSTEMS

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$ 10,665,540	10	20

The 2019 Hydroelectric Report recommended a 10-year average service life for this asset class. A current peer comparison of Canadian hydroelectric generation utilities produced a range from 15 to 50 years. As the peer range for this account indicates that a life longer than 10 years is appropriate, Concentric recommends a life lengthening to occur at this time. Concentric recommends a life of 20 years based on the results of the peer review.

ACCOUNT 16540000 –ADMINISTRATIVE AND SERVICE BUILDINGS – ADMINISTRATIVE TELECOM EQUIPMENT

Original Cost as of Dec 31, 2024	Previously Approved Life	Concentric Recommended Life
\$662,468	7	10

The previously recommended life for this asset class was a 7-year average service life. Due to its relatively small size, the DRC has not reviewed this account in recent years. A review of Canadian electric utilities suggests that a life of between 8 and 25 years is reasonable, however it is noted that peers often place a variety of asset types within this account. As OPG’s average service life is currently shorter than the peer range, Concentric recommends increasing the life of this account to 10 years.



SECTION 4

4 RESULTS OF STUDY

4.1 Results

The following tables provides a summary, by each asset group, of the original cost as of December 31, 2024 and the recommended average service life of each asset group.

Ontario Power Generation Inc.

TABLE 1 - ESTIMATED SURVIVOR CURVE, ORIGINAL COST, ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2024 DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT

Account	Account Description	Current Service Life	Recommended Service Life	Original Cost as of Dec. 31, 2024	Accumulated Depreciation	Net Book Value	Calculated Annual Accrual Rate
10000100	Hydroelectric - Intangibles	100	100	\$ 1,898,268	\$ 76,722	\$ 1,821,546	1.00
10100000	Hydroelectric - Land Improvements	100	100	\$ 47,160,835	\$ 3,704,124	\$ 43,456,711	1.00
10101000	Hydroelectric - Excavation, Dredging, Riprapping, Grouting	100	100	\$ 2,520,004,824	\$ 517,672,061	\$ 2,002,332,763	1.00
10110000	Hydroelectric - Land - pre - 1999	100	100	\$ 31,277,907	\$ 4,606,050	\$ 26,671,857	1.00
10200000	Hydroelectric - Substructures and Superstructures	100	100	\$ 1,586,337,529	\$ 367,229,184	\$ 1,219,108,345	1.00
10201000	Hydroelectric - Roofing	30	30	\$ 76,511,250	\$ 14,477,020	\$ 62,034,230	3.33
10202000	Hydroelectric - Fencing	25	25	\$ 16,166,668	\$ 4,642,201	\$ 11,524,467	4.00
10205000	Hydroelectric - Outdoor Structures	70	70	\$ 89,287,018	\$ 13,740,453	\$ 75,546,565	1.43
10210000	Hydroelectric - Service and Equipment Buildings	55	55	\$ 136,021,114	\$ 52,543,624	\$ 83,477,490	1.82
10300000	Hydroelectric - Canal, Forebay, Retaining Wall Lining	75	75	\$ 243,229,932	\$ 49,956,825	\$ 193,273,107	1.33
10301000	Hydroelectric - Lining of Tunnels and Permanent Shafts	75	75	\$ 272,752,778	\$ 92,917,262	\$ 179,835,516	1.33
10301100	Hydroelectric - Lining of Tunnels and Permanent Shafts (90Y)	90	90	\$ 363,261,026	\$ 47,734,538	\$ 315,526,488	1.11
10302000	Hydroelectric - Spillways, Sluices, Flumes	75	75	\$ 187,930,672	\$ 32,408,315	\$ 155,522,357	1.33
10302100	Hydroelectric - Public Safety/Warning Booms	10	10	\$ 40,624,600	\$ 18,695,590	\$ 21,929,010	10.00
10306000	Hydroelectric - Surgetank, Pipeline, Conduit, Penstock	90	90	\$ 390,284,702	\$ 112,245,390	\$ 278,039,313	1.11
10311000	Hydroelectric - Dams - Earth and Rockfill	100	100	\$ 177,960,289	\$ 34,207,525	\$ 143,752,763	1.00
10312000	Hydroelectric - Dams - Concrete	100	100	\$ 1,243,694,568	\$ 297,850,333	\$ 945,844,236	1.00
10315000	Hydroelectric - Steel Racks	40	40	\$ 16,497,042	\$ 6,505,194	\$ 9,991,848	2.50
10318000	Hydroelectric - Gates, Stoplogs and Operating Mechanisms	50	45	\$ 673,206,384	\$ 214,018,392	\$ 459,187,993	2.22
10400000	Hydroelectric - Turbines & Governors	70	70	\$ 418,814,816	\$ 186,468,088	\$ 232,346,729	1.43
10405000	Hydroelectric - Turbine Runners	40	40	\$ 251,760,488	\$ 93,320,739	\$ 158,439,749	2.50
10500000	Hydroelectric - Main Rotating Electrical Pilots - Windings	45	45	\$ 335,722,951	\$ 125,332,115	\$ 210,390,836	2.22
10501000	Hydroelectric - Main Rotating Electrical Pilots - Machinery less Windings	100	100	\$ 359,710,595	\$ 141,917,651	\$ 217,792,943	1.00
10502000	Hydroelectric - Bus, Switching and Power Cables	50	50	\$ 198,711,266	\$ 74,474,339	\$ 124,236,927	2.00
10503000	Hydroelectric - High Voltage Switching	40	40	\$ 55,896,465	\$ 18,470,173	\$ 37,426,291	2.50
10503100	Hydroelectric - Revenue Metering - High Voltage Switching, Control Boards / Switchboards	30	30	\$ 24,629,076	\$ 19,491,128	\$ 5,137,949	3.33
10504000	Hydroelectric - Control Boards and Switchboards	25	25	\$ 325,845,927	\$ 130,628,449	\$ 195,217,478	4.00
10505000	Hydroelectric - Station Service Electrical Equipment	45	40	\$ 181,305,123	\$ 62,512,255	\$ 118,792,867	2.50
10510000	Hydroelectric - Main Power and Station Service - Transformers	50	50	\$ 320,718,030	\$ 118,004,323	\$ 202,713,707	2.00
10531000	Hydroelectric - Circuit Breakers	50	50	\$ 9,813,939	\$ 3,216,770	\$ 6,597,169	2.00
10601000	Hydroelectric - Mechanical Equipment - Cranes and Followers	55	55	\$ 201,341,976	\$ 43,045,298	\$ 158,296,678	1.82
10700000	Hydroelectric - Auxiliary Systems	30	30	\$ 241,286,676	\$ 117,775,408	\$ 123,511,268	3.33
10709000	Hydroelectric - Owned Bridges, Railway Tracks and Wharves	65	65	\$ 86,799,525	\$ 30,169,618	\$ 56,629,907	1.54
10710000	Hydroelectric - Fire Protection Systems	20	20	\$ 48,551,599	\$ 43,014,687	\$ 5,536,912	5.00
10720000	Hydroelectric - Electronic Security Systems	10	20	\$ 10,665,540	\$ 6,375,359	\$ 4,290,182	5.00
10991000	Hydroelectric - Major / Strategic Spares	100	100	\$ 22,840,357	\$ 1,898,395	\$ 20,941,962	1.00

Ontario Power Generation Inc.

**TABLE 1 - ESTIMATED SURVIVOR CURVE, ORIGINAL COST, ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2024
DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

Account	Account Description	Current Service Life	Recommended Service Life	Original Cost as of Dec. 31, 2024	Accumulated Depreciation	Net Book Value	Calculated Annual Accrual Rate
11200000	Transfer and Distribution Stations - Buildings	50	55	\$ 184	\$ 184	-	-
16100000	Administrative and Service Buildings - Lands	N/A	N/A	\$ 600,000	\$ 8,242	\$ 591,758	0.00
16210000	Administrative and Service Buildings - Perm Buildings, Roads and Site Improvements	50	50	\$ 11,545,689	\$ 5,680,397	\$ 5,865,292	2.00
16211000	Administrative and Service Buildings - Buildings - Leased	10	10	\$ 1,285,639	\$ 1,285,639	\$ -	10.00
16220000	Administrative and Service Buildings - Buildings	10	10	\$ 38,554,162	\$ 2,524,386	\$ 36,029,777	10.00
16230000	Administrative and Service Buildings - Buildings - Frame & Metal Clad	25	25	\$ 14,935,436	\$ 852,733	\$ 14,082,703	4.00
16540000	Administrative and Service Buildings - Administrative Telecom Equipment	7	10	\$ 662,468	\$ 382,531	\$ 279,937	10.00
16550000	Administrative and Service Buildings - LAN Cable	10	10	\$ 6,423,078	\$ 6,423,078	-	10.00
16551000	Administrative and Service Buildings - LAN Elect Connecting Devices	5	5	\$ 1,877,121	\$ 1,877,121	-	20.00
16560100	Administrative and Service Buildings - Intangibles Administrative System Software	5	5	\$ 6,583,822	\$ 6,583,822	-	20.00
16630000	Administrative and Service Buildings - Building Systems and Equipment	20	20	\$ 1,232,214	\$ 772,301	\$ 459,914	5.00
18100000	Communications - Land	N/A	N/A	\$ 1,073	\$ 364	\$ 709	0.00
18200000	Communications - Buildings	50	50	\$ 94,369	\$ 64,942	\$ 29,427	2.00
18400000	Communications - Power Line Equipment	15	15	\$ 1,239,513	\$ 1,239,513	-	6.67
18440000	Communications - System Control Computer Equipment	7	7	\$ 12,557,683	\$ 4,598,210	\$ 7,959,473	14.29
18460000	Communications - Data Acquisition Equipment, Human Machine Interface Equipment	15	15	\$ 4,950,411	\$ 2,282,082	\$ 2,668,328	6.67
18500000	Communications - Radio Equipment	15	15	\$ 2,270,646	\$ 621,640	\$ 1,649,006	6.67
18530000	Communications - Timber and Steel Structures	40	40	\$ 40,364	\$ 35,162	\$ 5,202	2.50
18540000	Communications - Administrative Telecom Equipment	7	7	\$ 2,427,295	\$ 2,427,295	-	14.29
18541000	Communications - Administrative Telecom Equipment - Revenue Metering	7	7	\$ 8,894,657	\$ 8,894,657	-	0.00
18600000	Communications - Poles and Cables	40	40	\$ 177,223	\$ 144,116	\$ 33,107	2.50
18630000	Communications - Optical Wire	25	25	\$ 4,176,216	\$ 1,294,445	\$ 2,881,771	4.00
18633000	Communications - Optical Wire - Revenue Metering	30	30	\$ 1,251,165	\$ 1,009,780	\$ 241,385	3.33
18700000	Communications - Power Supply Equipment	15	15	\$ 651,750	\$ 63,725	\$ 588,025	6.67
COMP1	Computers	5	5	\$ 843,690	\$ 737,477	\$ 106,212	20.00
OFFICE1	Office Furniture and Fixtures	3	3	\$ 241,050	\$ 241,050	-	33.33
SERV1	Minor Fixed Assets - Service Equipment	10	10	\$ 20,480,968	\$ 12,145,955	\$ 8,335,012	10.00
T&WE1	Transportation and Work Equipment	10	10	\$ 4,852,312	\$ 3,171,649	\$ 1,680,662	10.00
Total Plant				\$ 11,357,371,952	\$ 3,166,708,094	\$ 8,190,663,858	

MEMORANDUM

2024 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2024 Depreciation Review Committee Recommendations for the Hydroelectric Regulated facilities of Renewable Generation is requested.

Submitted by:



Promita Datta – Director, External Reporting and Accounting Policy

March 28, 2025

Date

Approved by:



Nicholas Pender – SVP, Renewable Generation & Energy Markets

March 31, 2025

Date



Aida Cipolla – Chief Financial Officer & Chief Administrative Officer

March 31, 2025

Date



Brenda MacDonald – Chief Commercial Officer

March 31, 2025

Date

2024

DEPRECIATION REVIEW COMMITTEE
RECOMMENDATIONS

FOR

REGULATED RENEWABLE GENERATION

MARCH 2025

MEMORANDUM

2024 DRC Recommendations – Renewable Generation

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2024 Depreciation Review Committee (DRC) review of the average service lives of selected asset classes for OPG's regulated hydroelectric facilities.

BACKGROUND

The DRC convenes 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 its 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."

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the hydroelectric business was performed by Concentric Advisors ULC (Concentric) in 2019. The results of Concentric's review are summarized in the 2019 DRC report. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the hydroelectric assets in 2021. This report is the fourth year of the five-year cycle. Another Concentric depreciation assessment is currently underway and the results of the review will be considered in the next DRC report.

SCOPE OF 2024 DRC REVIEW FOR REGULATED HYDROELECTRIC

Asset Class Review

Seven regulated hydroelectric major fixed asset classes and one minor fixed asset class were selected for the 2024 DRC review as part of the five-year cycle. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in the previous years of the review cycle, and assets identified for review by business unit/site contacts based on operational knowledge.

MEMORANDUM

2024 DRC Recommendations – Renewable Generation

The asset classes selected for review were as follows:

Asset Class
10405000 – Hydroelectric – Turbine Runners
10503000 – Hydroelectric – High Voltage Switching
10503100 – Hydroelectric – High Voltage Switching – Revenue Metering
10505000 – Hydroelectric – Station Electrical Equipment
10700000 – Hydroelectric – Auxiliary Systems
10709000 – Hydroelectric – Owned Bridges
10710000 – Hydroelectric – Fire Protection System
Serv1 – Service Minor Fixed Assets

These asset classes represent approximately 6% of the total net book value of the in-service fixed asset classes of the regulated hydroelectric business as at December 31, 2024. Combined with the previous DRC reviews in the cycle, 86% of the total in-service fixed assets of the regulated hydroelectric business have now been covered.

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 hydroelectric business unit;
- information obtained from past DRC reviews;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Asset Class Review

A summary of the conclusions from the 2024 DRC review of the average service lives of the regulated hydroelectric facilities is outlined below:

Asset Class	Recommendation
10405000 – Hydroelectric – Turbine Runners	Retain the current service life of 40 years
10503000 – Hydroelectric – High Voltage Switching	Retain the current service life of 40 years
10503100 – Hydroelectric – High Voltage Switching – Revenue Metering	Retain the current service life of 30 years
10505000 – Hydroelectric – Station Electrical Equipment	Retain the current service life of 45 years
10700000 – Hydroelectric – Auxiliary Systems	Retain the current service life of 30 years
10709000 – Hydroelectric – Owned Bridges	Retain the current service life of 65 years
10710000 – Hydroelectric – Fire Protection System	Retain the current service life of 20 years
Serv1 – Service Minor Fixed Assets	Retain the current service life of 10 years

MEMORANDUM

2024 DRC Recommendations – Renewable Generation

Summary of impact

Based on the recommendations above, there is no impact to the annual depreciation expense for the regulated hydroelectric business.

MEMORANDUM

2024 DRC Recommendations – Renewable Generation

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:

Name	Position
Nicholas Pender	SVP, Renewable Generation & Energy Markets
Aida Cipolla	Chief Financial Officer & Chief Administrative Officer
Brenda MacDonald	Chief Commercial Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Senior Vice President, Chief Controller & Accounting Officer
Promita Datta	Director, External Reporting and Accounting Policy
Matthew Kirk	Director, Ontario Regulatory Affairs
Graeme Mumberson	Senior Manager, External Reporting and Accounting Policy
Stephanie Leung	Senior Manager, Investment Management
Peter Hassan	Director, Engineering Services

The key technical contacts for Renewable Generation are:

Name	Position
Jeff Wells	Senior Manager, RG Central Engineering (Mechanical)
Damon Delong	Senior Manager, RG Central Engineering (Electrical)
Navin Gautam	Senior Manager, RG Central Engineering (Civil)

MEMORANDUM

2023 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2023 Depreciation Review Committee Recommendations for the Hydroelectric Regulated facilities of Renewable Generation is requested.

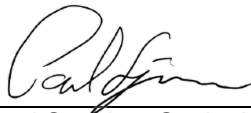
Submitted by:



Promita Datta – Director, External Reporting and Accounting Policy

March 25, 2024
Date

Approved by:




Paul Seguin – Senior Vice President, Renewable Generation

March 29, 2024
Date



Aida Cipolla – Chief Financial Officer

March 29, 2024
Date



Brenda MacDonald – Chief Commercial Officer

March 29, 2024
Date

2023

DEPRECIATION REVIEW COMMITTEE

RECOMMENDATIONS

FOR

REGULATED RENEWABLE GENERATION

MARCH 2024

MEMORANDUM

2023 DRC Recommendations – Renewable Generation

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2023 Depreciation Review Committee (DRC) review of the average service lives of selected asset classes for OPG's regulated hydroelectric facilities.

BACKGROUND

The DRC convenes 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 its 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."

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the hydroelectric business was performed by Concentric Advisors ULC (Concentric) in 2019. The results of Concentric's review are summarized in the 2019 DRC report. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the hydroelectric assets in 2021. This report is the third year of the five-year cycle.

SCOPE OF 2023 DRC REVIEW FOR REGULATED HYDROELECTRIC

Asset Class Review

Six regulated hydroelectric major fixed asset classes were selected for the 2023 DRC review as part of the five-year cycle. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in the previous years of the 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
10100000 – Hydroelectric – Land Improvements
10101000 – Hydroelectric – Excavation and Dredging
10200000 – Hydroelectric – Substructures and Super Structures
10301000 – Hydroelectric – Tunnel Linings
10502000 – Hydroelectric – Buses, Switches and Power Cables
10510000 – Hydroelectric – Main Power and Station Service

MEMORANDUM

2023 DRC Recommendations – Renewable Generation

These asset classes represent approximately 48% of the total net book value of the in-service fixed asset classes of the regulated hydroelectric business as at December 31, 2023. Combined with the previous DRC reviews in the cycle, 80% of the total in-service fixed assets of the regulated hydroelectric business have now been covered.

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 hydroelectric business unit;
- information obtained from past DRC reviews;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Asset Class Review

A summary of the conclusions from the 2023 DRC review of the average service lives of the regulated hydroelectric facilities is outlined below:

Asset Class	Recommendation
10100000 – Hydroelectric – Land Improvements	Retain the current service life of 100 years
10101000 – Hydroelectric – Excavation and Dredging	Retain the current service life of 100 years
10200000 – Hydroelectric – Substructures and Super Structures	Retain the current service life of 100 years
10301000 – Hydroelectric – Tunnel Linings	Retain the current service life of 75 years
10502000 – Hydroelectric – Buses, Switches and Power cables	Retain the current service life of 50 years
10510000 – Hydroelectric – Main Power and Station Service	Retain the current service life of 50 years

Summary of impact

Based on the recommendations above, there is no impact to the annual depreciation expense for the regulated hydroelectric business.

MEMORANDUM

2023 DRC Recommendations – Renewable Generation

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:

Name	Position
Brenda MacDonald	Chief Commercial Officer
Aida Cipolla	Chief Financial Officer
Paul Seguin	Senior Vice President, Renewable Generation

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Senior Vice President, Chief Controller & Accounting Officer
Promita Datta	Director, External Reporting and Accounting Policy
Matthew Kirk	Director, Ontario Regulatory Affairs
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Garry Lam	Senior Manager, Investment Management, Nuclear Finance
Peter Hassan	Director, Station Engineering

The key technical contacts for Renewable Generation are:

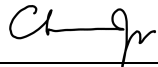
Name	Position
Jeff Wells	Senior Manager, Engineering (Mechanical, Electrical & Control)
Andrew Meikle	Plant Technical Support Manager (Electrical Power Equipment)
Louis Adeghe	Senior Manager, Engineering (Civil Engineering)

MEMORANDUM

2022 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2022 Depreciation Review Committee Recommendations for the Hydroelectric Regulated facilities of Renewable Generation is requested.

Submitted by:



Chessa Jope – Director, External Reporting and Accounting Policy

March 17, 2023

Date


Approved by:



Paul Seguin – Senior Vice President, Renewable Generation

March 20, 2023

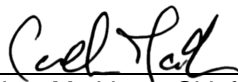
Date



Aida Cipolla – Chief Financial Officer & SVP Finance

March 30, 2023

Date



Carlton Mathias – Chief Legal, ESG and Governance Officer

March 20, 2023

Date

2022

DEPRECIATION REVIEW COMMITTEE

RECOMMENDATIONS

FOR

REGULATED RENEWABLE GENERATION

MARCH 2023

MEMORANDUM

2022 DRC Recommendations – Renewable Generation

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2022 Depreciation Review Committee (DRC) review of the average service lives of selected asset classes for OPG's regulated hydroelectric facilities.

BACKGROUND

The DRC convenes 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 its 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."

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG's asset classes for the hydroelectric business was performed by Concentric Advisors ULC (Concentric) in 2019. The results of Concentric's review are summarized in the 2019 DRC report. To create alignment with the external review and assessment completed, the DRC restarted the five-year review cycle for the hydroelectric assets in 2021. This report is the second year of the five-year cycle.

SCOPE OF 2022 DRC REVIEW FOR REGULATED HYDROELECTRIC

Asset Class Review

Seven regulated hydroelectric Major Fixed Asset classes were selected for the 2022 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in 2021 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
10201000 – Hydroelectric – Roofing
10202000 – Hydroelectric – Fencing
10205000 – Hydroelectric – Outdoor Structures
10210000 – Hydroelectric – Service and Equipment Buildings
10300000 – Hydroelectric – Linings of Canals
10302100 – Hydroelectric – Public Safety/Warning Booms
10312000 – Hydroelectric – Dams - Concrete

MEMORANDUM

2022 DRC Recommendations – Renewable Generation

These asset classes make up approximately 17% of the total net book value of the in-service fixed asset classes of the regulated hydroelectric business as at December 31, 2022. Combined with the 2021 DRC review, 33% of the total in-service fixed assets in the regulated hydroelectric business have now been covered.

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 hydroelectric business unit;
- information obtained from past DRC reviews; and
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Asset Class Review

A summary of the conclusions from the internal 2022 DRC review of the average service lives of the regulated hydroelectric facilities is outlined in the table below.

Asset Class	Recommendation
10201000 – Hydroelectric – Roofing	Retain the current service life of 30 years as no significant change in this asset class life has been observed
10202000 – Hydroelectric – Fencing	Retain the current service life of 25 years as no significant change in this asset class life has been observed
10205000 – Hydroelectric – Outdoor Structures	Retain the current service life of 70 years as no significant change in this asset class life has been observed
10210000 – Hydroelectric – Service and Equipment Buildings	Retain the current service life of 55 years as no significant change in this asset class life has been observed
10300000 – Hydroelectric – Linings of Canals	Retain the current service life of 75 years as no significant change in this asset class life has been observed
10302100 – Hydroelectric – Public Safety/Warning Booms	Retain the current service life of 10 years as no significant change in this asset class life has been observed
10312000 – Hydroelectric – Dams - Concrete	Retain the current service life of 100 years as no significant change in this asset class life has been observed

Summary of impact

Based on the recommendations above, there is no impact to the annual depreciation expense in the regulated hydroelectric business and the currently approved average service life estimates for all reviewed asset classes remain appropriate.

MEMORANDUM

2022 DRC Recommendations – Renewable Generation

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:

Name	Position
Carlton Mathias	Chief Legal, ESG and Governance Officer
Aida Cipolla	Chief Financial Officer and Senior Vice President, Finance
Paul Seguin	Senior Vice President, Renewable Generation

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Vice President, Chief Controller & Accounting Officer
Chessa Jope	Director, External Reporting and Accounting Policy
Matthew Kirk	Senior Manager, Ontario Regulatory Affairs
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Garry Lam	Senior Manager, Investment Management, Nuclear Finance
Peter Hassan	Director, Plant Engineering Services

The Key Technical Contacts for Renewable Generation are:

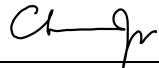
Name	Position
Peter Hassan	Director, Plant Engineering Services
David Rogalski	Senior Manager, Computer & Control Design, Mechanical Electrical and Computer
Hassan Qadri	Director, Engineering Services, Chemistry & Civil
Louis Adaghe	Senior Manager, Civil Engineering

MEMORANDUM

2021 Ontario Power Generation Inc. Depreciation Review Committee

Your approval of the 2021 Depreciation Review Committee Recommendations for the Regulated Hydroelectric facilities of Renewable Generation is requested.

Submitted by:



Chessa Jope – Director, External Reporting and Accounting Policy

March 14, 2022

Date


Approved by:



Paul Seguin – Senior Vice President, Renewable Generation

March 14, 2022

Date



John Mauti – Chief Financial Officer and Senior Vice President,
Finance

March 14, 2022

Date



Shelley Babin – Chief Legal and Ethics Officer

March 14, 2022

Date

2021

DEPRECIATION REVIEW COMMITTEE

RECOMMENDATIONS

FOR

REGULATED RENEWABLE GENERATION

MARCH 2022

MEMORANDUM

2021 DRC Recommendations – Renewable Generation

PURPOSE AND SUMMARY

This memorandum is intended to obtain approval for the recommendations resulting from the 2021 Depreciation Review Committee (DRC) review of the average service lives of selected asset classes for OPG’s regulated hydroelectric facilities.

BACKGROUND

The DRC convenes 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 its average service life estimates was considered appropriate by Concentric Advisors ULC (Concentric) (previously operating as Gannett Fleming ULC (GF)), an external consultant. In the report on OPG’s depreciation rates 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.”

To supplement the DRC process, an independent external review and assessment of depreciation rates for OPG’s asset classes for the hydroelectric business was performed by Concentric in 2019. To create alignment with the external review and assessment completed, the DRC restarted the five year review cycle for the hydroelectric assets in 2021, with the remaining asset classes from the previous cycle reviewed in 2021 as the first year of the new five year period.

SCOPE OF 2021 DRC REVIEW FOR REGULATED HYDROELECTRIC

Asset Class Review

Nine regulated hydroelectric Major Fixed Asset classes were selected for the 2021 DRC review. The asset classes reviewed were determined based on a selection of higher value asset classes (with a net book value of greater than \$5 million), classes that had not been reviewed by the DRC in the previous 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
10000100 – Hydroelectric – Intangibles
10301100 – Hydroelectric – Lining of Tunnels and Permanent Shafts (90Y)
10302000 – Hydroelectric – Spillways, Sluices and Flumes
10311000 – Hydroelectric – Dams, Earth and Rockfill
10315000 – Hydroelectric – Steel Racks
10306000 – Hydroelectric – Surgetank, Pipeline, Conduit, Penstock
10400000 – Hydroelectric – Turbines and Governors
10601000 – Hydroelectric – Mechanical Equipment - Cranes and Followers
16210000 – Administrative & Service Buildings – Permanent Buildings, Roads, Site Improvements

MEMORANDUM

2021 DRC Recommendations – Renewable Generation

These asset classes make up approximately 12% of the total net book value of the regulated depreciable, in-service fixed asset classes of the hydroelectric business as at December 31, 2021.

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 hydroelectric business unit;
- information obtained from past DRC reviews;
- industry experience; and
- internal consistency of service life estimates.

SUMMARY OF RECOMMENDATIONS

Asset Class Review

A summary of the conclusions from the internal 2021 DRC review of the average service lives of the regulated hydroelectric facilities is outlined in the table below.

Asset Class	Recommendation
10000100 – Hydroelectric – Intangibles	Retain the current 100 years average service life
10301100 – Hydroelectric – Lining of Tunnels and Permanent Shafts (90Y)	Retain the current 90 years average service life
10302000 – Hydroelectric – Spillways, Sluices and Flumes	Retain the current 75 years average service life
10311000 – Hydroelectric – Dams, Earth and Rockfill	Retain the current 100 years average service life
10315000 – Hydroelectric – Steel Racks	Retain the current 40 years average service life
10306000 – Hydroelectric – Surgetanks, Pipeline, Conduit, Penstock	Retain the current 90 years average service life
10400000 – Hydroelectric – Turbines and Governors	Retain the current 70 years average service life
10601000 – Hydroelectric – Mechanical Equipment - Cranes and Followers	Retain the current 55 years average service life
16210000 – Administrative & Service Buildings – Permanent Buildings, Roads and Site Improvements	Retain the current 50 years average service life

Summary of Impact

Based on the recommendations above, there is no impact to the annual depreciation expense in the regulated hydroelectric business and the currently approved average service life estimates for all reviewed asset classes remain appropriate.

MEMORANDUM

2021 DRC Recommendations – Renewable Generation

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:

Name	Position
Paul Seguin	Senior Vice President, Renewable Generation
John Mauti	Chief Financial Officer and Senior Vice President, Finance
Shelley Babin	Chief Legal and Ethics Officer

The DRC is comprised of the following members:

Name	Position
Alec Cheng	Vice President, Chief Controller & Accounting Officer
Chessa Jope	Director, External Reporting and Accounting Policy
Jyoti Kumar	Senior Manager, External Reporting and Accounting Policy
Matthew Kirk	Senior Manager, Ontario Regulatory Affairs
Bryan Shaddock	Director, Renewable Generation Controllership
Peter Hassan	Director, Plant Engineering Services

The Key Technical Contacts for Renewable Generation are:

Name	Position
David Rogalski	Senior Manager, Computer & Control Design, Mechanical Electrical and Computer
Hassan Qadri	Director, Engineering Services, Chemistry & Civil



ASSESSMENT OF REGULATED HYDROELECTRIC ASSET DEPRECIATION RATES

DECEMBER 2019

Prepared for Ontario Power Generation

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December 2019

Ontario Power Generation
700 University Avenue
Toronto, ON M5G 1X6

Attention: Matt Kirk
Senior Manager, Regulatory Research & Analysis

Dear Mr. Kirk;

Pursuant to your request, we conducted a review and assessment of the regulated life estimates related to the Ontario Power Generation hydroelectric generation assets as of December 31, 2018. Our report presents a description of review undertaken by Concentric as well as our recommendations for a small number of revisions to the average service life estimates.

We gratefully acknowledge the assistance of Ontario Power Generation personnel in the completion of the review.

Should you have any questions or concerns, please do not hesitate to contact me directly at 587.997.6489

Yours truly,

Concentric Advisors, ULC

A handwritten signature in black ink, appearing to read "LEK", is written over a light blue horizontal line.

Larry E. Kennedy
Vice President

LEK/ta
Project: 70061



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SECTION 1

1 BASIS OF STUDY

1.1 Scope

Concentric Advisors, ULC (“Concentric” or “Concentric Advisors”) has been retained by Ontario Power Generation (“OPG”) to review the average service life estimates of its regulated hydroelectric generation assets based on December 31, 2018 asset values. This report sets forth the findings of our independent review. The average service life estimates recommended in this report are considered in OPG’s depreciation review process in establishing the asset depreciation rates and generating station lives for the Property, Plant and Equipment (“PP&E”) of OPG’s prescribed facilities, including directly assigned corporate PP&E balances. As the depreciation and amortization expense for regulated revenue requirement purposes includes intangible assets, average service lives for intangible assets were also included in this analysis.

The facilities for which average service lives were analyzed consist of 54 hydroelectric stations prescribed for OEB rate regulation by *Ontario Regulation 53/05* under *Ontario Energy Board Act, 1998*. As part of this study, Concentric Advisors reviewed the operating considerations and typical station configurations of these 54 hydroelectric stations. This included site tours of several of these hydroelectric generating stations (Sir Adam Beck I and II, Ranney Falls, and R. H. Saunders), review of notes from site tours taken in prior studies, and detailed operational staff discussions.

1.2 Background

In March 2007, Concentric Advisors (then operating as Gannett Fleming) submitted a report titled “Review of the Ontario Power Generation Inc. Depreciation Review Process” (the “2007 Report”). The 2007 Report presented a summary of the findings of an independent review of the processes, procedures and methods used by OPG to review its depreciation expense. The 2007 Report indicated that “Gannett Fleming has found that the processes, procedures and methods followed by Ontario Power Generation Inc. adequately meet regulatory objectives regarding depreciation generally accepted by Canadian regulatory authorities.”¹

Additionally, Gannett Fleming found that “OPG’s current Depreciation Review Process results in the depreciation expense component of the revenue requirement that reasonably and appropriately reflects the consumption of the average service life of OPG’s regulated assets. Gannett Fleming also views that, overall, the DRC [Depreciation Review Committee] process is adequate in meeting the generally accepted regulatory objectives regarding depreciation for regulated North American utilities.”² Overall, the 2007 Report concluded that the procedural foundation upon which OPG’s DRC had developed average service life estimates was robust and appropriate. The 2007 Report contributed, in part, to the Ontario Energy Board’s (“OEB”) acceptance of OPG’s depreciation expense in the EB-2010-0008 proceeding.

¹ Cover letter to the 2007 Report

² 2007 Report, page III-2.



Subsequently, Gannett Fleming was retained by OPG to complete independent comprehensive assessments of depreciation rates and generating station lives of OPG's prescribed hydroelectric and nuclear assets based on December 31, 2010 and, most recently, December 31, 2012 asset values and for the Niagara Tunnel placed in service in 2013. These assessments were documented by Gannett Fleming in reports titled "Assessment of Regulated Asset Depreciation Rates and Generating Station Lives" dated December 16, 2011 ("2011 Report") and November 29, 2013 ("2013 Report"), respectively.

Both the 2011 Report and the 2013 Report found that "the currently approved average service life estimates continued to be based on a procedurally sound and reasonable DRC process" and that "to a large extent, the work prepared over the past several years by the DRC [continued] to be a reliable information source."³ Both reports noted that OPG had continued to calculate depreciation rates based on the Average Life Group Procedure – Whole Life Technique, using the straight-line method of depreciation for virtually all plant comprising regulated assets.

As part of the 2011 Report and the 2013 Report, Gannett Fleming reviewed the average service life estimates for each depreciable group and generating station lives based on their professional judgement, taking into consideration the results of the DRC process, the company's practices and outlook as they relate to plant operation, asset condition and retirement, the service life estimates of peer electric generation companies (as applicable), and the experience of Gannett Fleming in selecting average service lives for similar plant. In adopting this approach to their assessment, Gannett Fleming noted that "[i]n the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed study of retirement history" and "[a]s such, a retirement rate analysis was not completed by Gannett Fleming."⁴ The 2011 Report and the 2013 Report recommended a small number of revisions to the average service life estimates for OPG's hydroelectric assets, which were adopted in full by OPG.

Gannett Fleming also recommended that each "account should be subjected to a complete depreciation study which re-evaluates its average service life estimates periodically", noting "that the practice of OPG to review its various asset accounts and depreciation service lives over an approximate five-year cycle [through the DRC process] meets this common depreciation practice."⁵

The 2011 Report and 2013 Report were filed with the OEB in OPG's 2014-2015 payment amounts proceeding (EB-2013-0321), in satisfaction of the OEB's direction regarding an independent depreciation study. In its EB-2013-0321 decision, the OEB accepted the results of the 2011 Report as updated by the 2013 Report for both nuclear and hydroelectric assets, including OPG's continued use of the average life group method to determine depreciation expense, and approved the depreciation expense as filed for inclusion in OPG's payment amounts.⁶ EB-2013-0321 is the most recent cost-based hydroelectric payment amounts OEB proceeding for OPG.

³ 2013 Report, page I-7

⁴ 2013 Report, page II-11

⁵ 2013 Report, page I-11

⁶ EB-2013-0321 Decision with Reasons, page 98



1.3 Summary of Results

Concentric has reviewed the DRC process and again finds it to be procedurally sound, reasonable and resulting in valid depreciation rates that accurately reflect the consumption of average service life of OPG's regulated assets. Overall, Concentric finds that the work prepared by the DRC continues to be a reliable source of information in conducting this 2019 Depreciation Rates Assessment.

Concentric also finds that OPG's practice of reviewing significant asset accounts and depreciation service lives over an approximate five-year cycle under the DRC process continues to meet the recommended practice of continued surveillance to maintain the use of appropriate depreciation rates, when supplemented by a periodic comprehensive independent assessment.

Concentric also finds OPG's continued use of the Straight-Line Method and the Average Life Group Procedure – Whole Life Technique to determine depreciation expense to be reasonable.

In reviewing depreciation rates for OPG's hydroelectric plant accounts, Concentric supports the average service lives currently in use, subject to recommended changes for the following three accounts:

- Hydroelectric – Outdoor Structures: from 75 years to 70 years;
- Hydroelectric – Bus, Switching and Power Cable: from 45 years to 50 years; and
- Hydroelectric – Station Service Electrical Equipment: from 50 years to 45 years.



SECTION 2

2 PLAN OF STUDY

This study is presented in the following order:

Section 1:	Presents the Scope of the Study and provides background of prior study conclusions with a brief summary of the depreciation study results
Section 2:	Contains statements with respect to the plan and the basis of the study
Section 3:	Discusses development of average service life estimates, and presents descriptions of the methods used and factors considered in the service life study
Section 4:	Presents study results by depreciable group in Table 1

2.1 Information Provided by OPG

OPG has provided Concentric with required information, as of December 31, 2018, for all accounts being studied. This information has been compiled from the plant accounting records and includes the following:

- current balances by vintage year for each account (aged balances). The balances provide the amount of investment sorted by installation year currently in operation. This file is only inclusive of current plant in service and does not include any retirement information; and
- retirement transactions for all accounts. The transactions include information regarding the transaction year of the retirement, the installation year of the asset being retired, and the original cost of the asset being retired.
- copies of the most recent DRC reviews for all regulated hydro plant asset accounts.

2.2 Procedures Performed

The above data was reviewed and reconciled to Company control schedules to ensure accuracy and reasonableness. These checks include that the surviving investment by account equals (or can be reconciled to) the Company's gross plant in service and accumulated depreciation ledger balances. In addition, Concentric performed the following procedures to form the basis of the results of this study:

- confirm accounting policies being followed in accordance with US generally accepted accounting principles;
- conduct interviews with OPG personnel to obtain understanding of nuclear plant operations;
- review of DRC recommendations and supporting documentation;
- review of prior working papers and supporting documents from the 2011 Report and the 2013 Report; and
- comparison against industry peers that operate facilities similar to OPG's regulated hydro fleet.



SECTION 3

3 DEVELOPMENT OF DEPRECIATION RATES

3.1 Depreciation

Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities, and, in the case of electric companies, the exhaustion of natural resources.⁷

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a time period by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing electric utility service. Normally, the time over which the fixed capital cost is allocated to the cost of service, is equal to the time over which an item renders service – that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the Straight-Line method of depreciation.

OPG continues to determine depreciation using the Straight-Line method for virtually all plant comprising regulated assets, based on the Average Life Group Procedure – Whole Life Technique. The Average Life Group Procedure is the most commonly used depreciation procedure for North American utilities, whereby one average service life estimate is applied to all assets and vintages within the asset class. The Whole Life Technique calculates depreciation on the basis of recovering the original cost of the investment over the entire life of an asset or group of assets with no provision for accumulated depreciation true-ups or depreciation rate adjustments. As such, a common life estimate is applied to each of the asset vintages, and each of the assets within each vintage. Concentric finds the application of the Straight-Line method and the Average Life Group Procedure – Whole Life Technique results in a reasonable recovery of OPG's capital investment over time and recommends their continued application.

3.2 Estimation of Generating Asset Lives

3.2.1 Average Service Life

The use of an average service life for property groups that include large numbers of similar assets implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a life estimate that considers the retirements of units which survive at successive ages. As in the 2011 Report and the 2013 Report,

⁷ Federal Energy Regulatory Commission -Part 201- Uniform System of Accounts Prescribed for Electric Companies Subject to the Provisions of the Electric Act Definitions



the average service life estimates in this study were reviewed by Concentric Advisors using budgeting which considered a number of factors, including:

- Understanding of the processes used in the development of the currently used average service life estimates through the completion of the 2007 Report reviewing the DRC process and through the completion of the 2011 Report and the 2013 Report assessing the depreciation rates;
- Understanding of the assets currently in service through discussions with company staff, including representatives of the hydroelectric generation operating units;
- Physical site tours of hydroelectric generation sites;
- Review of current accounting practices and procedures applied and their consistency with those in place at the time of the 2013 Report;
- Review of analyses provided to DRC, up to the draft results of the 2019 DRC process;
- Average service life estimates from other peer electric generation companies; and,
- The general experience and professional judgment of Concentric Advisors.

3.2.2 Prior Assignments and Review of the DRC Process

As described in section 1.2, Concentric Advisors (then operating as Gannett Fleming) was previously retained in 2007 to review the practices and procedures used by the DRC to review depreciation expense, and, in 2011 and 2013, for the completion of depreciation studies for OPG's regulated assets. The 2007 review resulted in a report submitted to OPG management and filed by OPG in OEB proceeding EB-2007-0905. The 2013 depreciation study resulted in a report submitted to OPG management in 2013 and filed by OPG in OEB proceeding EB-2013-0321. These prior reviews provided Concentric with an understanding of the type of generation plant in service at OPG, the processes used by OPG in the determination of service life estimates, and the OEB's regulatory oversight. In addition to updated information provided by OPG for this current review, Concentric considered information from these prior studies.

3.2.3 Operating Discussions and Site Tours

Discussions with operations representatives and the physical site tours undertaken as part of this study (and previously as part of the 2011 Report and the 2013 Report) provided Concentric with an understanding of the type of assets in service for hydroelectric service. The site tours provide Concentric Advisors with the necessary background to make an assessment of the physical installations of the OPG plant, and to understand the type of plant in service and the operating conditions of the facilities.

Operational interviews were undertaken to understand the historic operating conditions that have led to retirement of plant in the past and to understand the current condition of the assets which may impact future retirement plans. In-person interviews were conducted both during and immediately following the physical site tours, and again after Concentric completed an initial analysis of the



average service life expectations. Additionally, discussions were held through a number of telephone interviews with operational representatives, prior to the plant tours.

In conducting the 2013 depreciation study, Gannett Fleming toured the following generation sites:

- Chats Falls Hydroelectric Generating Station;
- Arnprior Hydroelectric Generating Station;
- Stewartville Hydroelectric Generating Station;
- Calabogie Hydroelectric Generating Station;
- Barrett Chute Hydroelectric Generating Station;
- Chenaux Hydroelectric Generating Station;
- Des Joachims Hydroelectric Generating Station;
- Otto Holden Hydroelectric Generating Station;
- Bingham Chutte Hydroelectric Generating Station;
- Big Chute Hydroelectric Generating Station;
- Ragged Rapids Hydroelectric Generating Station;
- Hanna Chute Hydroelectric Generating Station;
- South Falls Hydroelectric Generating Station;
- Elliot Chute Hydroelectric Generating Station;
- Tretheway Falls Hydroelectric Generating Station; and
- Big Eddy Hydroelectric Generating Station;

In order to confirm and gain further understanding of OPG's regulated hydroelectric assets, Concentric toured the generation plants listed below in the course of the current assignment. Concentric Advisors toured a total of three regulated hydroelectric facilities, representing the largest and, in the case of Ranney Falls, the newest of OPG's regulated hydroelectric plant:

- R.H. Saunders Hydroelectric Generating Station;
- Sir Adam Beck I and II Hydroelectric Generating Stations; and
- Ranney Falls Hydroelectric Generating Station⁸.

Operational interviews covered the following topics, including, where applicable, inquiries regarding operating or other changes since the 2013 Report:

- Operating history of both the plant being toured and of other similar plant not toured;

⁸ Ranney Falls Hydroelectric Generating Station was undergoing a redevelopment project at the time of the physical site tour.



- Replacement history of major plant components and review of any significant programs;
- General operating experience of the major plant components;
- Review of any life restricting operational issues;
- Review of any issues that have emerged during the DRC process;
- Review of differences between smaller plants toured as part of the 2013 depreciation study and those toured as part of the current assignment, and any changes that may have occurred at the smaller facilities since the 2013 Report;
- Review of instances where advancements in technology may cause changes to average service life indications; and
- Discussions of the manner in which OPG's hydroelectric plants may differ from peer hydroelectric generation plants.

3.2.4 Review of Accounting Policies

Concentric had discussions with finance management representatives during prior assignments to understand OPG's depreciation and accounting policies and practices in accordance with United States Generally Accepted Accounting Principles ("US GAAP"). As part of the current assignment, Concentric confirmed with finance management representatives that there had been no changes to these policies and practices since the 2013 Report, including as they relate to capitalization thresholds, asset retirement obligations and treatment of retirement transactions.⁹

3.2.5 Analysis and Results of DRC Reviews

The DRC has continued to complete detailed reviews of the average service life expectations for OPG's plant accounts. The DRC's technical reviews are conducted by internal experts in the specific areas associated with a number of accounts, leveraging operational and industry experience. As part of the current assignment and the 2011 and 2013 Reports, Concentric reviewed these analyses which provided a significant background on the physical condition of the assets, a meaningful history of the manner in which plant assets have provided electric generation service over the past many years, and identified major upcoming replacement or retirement programs.

Since the completion of the 2013 Report, the DRC completed a detailed review of the average service life expectations for virtually all plant accounts comprising the company's investment in the regulated hydroelectric business. This included one complete five-year review cycle (2013-2017) for regulated hydroelectric asset depreciation rates and, most recently, a review of plant accounts comprising over 85 percent of the regulated hydroelectric investment as part of the current five-year

⁹ As previously noted in the 2013 Report (page II-7), OPG's accumulated depreciation accounts do not include embedded gains or losses from previous retirement transactions, as OPG books all such gains and losses to the income statement in the year of retirement in accordance with the provisions of US GAAP. As a result, there is no need to test the adequacy of accumulated depreciation balances. Concentric believes that the nature of the large plant components and small amount of retirement transactions continue to make this policy viable and reasonable for OPG.



review cycle beginning in 2018. The DRC process resulted in a small number of changes to depreciation rates since the 2013 Report, which were reviewed by Concentric as part of this assignment.

3.2.6 Peer Analysis

In order to provide a comparison for each account grouping, Concentric selected a peer group of companies to use in the development of average service lives. The companies selected for comparison were all companies for which Concentric has recently completed depreciation studies relating to Canadian hydroelectric generation plants. As such, Concentric was able to make a meaningful comparison giving consideration to factors such as capitalization and retirement policies, maintenance practices, and general operational practices. The companies selected for comparison were:

- BC Hydro;
- Manitoba Hydro;
- New Brunswick Power
- Newfoundland and Labrador Hydro Corporation (Nalcor); and
- Northwest Territories Power Corporation.

As noted in the 2011 Report and the 2013 Report, OPG's hydroelectric asset classes lend themselves to comparison with these utilities due to the similar nature of the technology used in hydroelectric energy production. As such, the above utilities provided Concentric Advisors with a comparable base of average service life estimates to use in the development of the service life estimates for OPG's hydroelectric asset classes through Concentric's professional judgement.

3.2.7 Professional Judgement

The use of professional judgment in the development of average service life estimates is a practice that is appropriate and has been used for many years before North American regulatory jurisdictions. When available, the use of statistical analysis of the historic retirement transactions combined with the use of professional judgment, which includes physical site inspections, review of accounting procedures and practices, use of operational staff interviews, review of prior studies, and review of the approved life estimates of peer companies, provides the most complete method of service life analysis. However, the use of professional judgment alone also provides an appropriate basis for developing average service life estimates, when appropriate factors are considered, and has been accepted as a valuable depreciation analysis tool in many North American jurisdictions.

As previously noted by Concentric in the 2013 Report, in the specific circumstances of the OPG average service life estimation, the volume of historic retirement transactions available to be analyzed is not sufficient to undertake a detailed actuarial study of retirement history. As such, a retirement rate analysis was not completed by Concentric Advisors.



3.2.8 Life Span Dates

Life expectancy of electric generation plant assets is impacted not only by physical wear and tear of the assets but also by economic factors including the feasibility of the economic replacement of major operating components or the economic viability of the plant as a whole. In circumstances where the replacement of major operating components is not economically feasible, the life of the major component can be the determining factor of the generation plant and all of the assets within the plant. As such, the remaining depreciation life of electric generation plant assets is the lesser of the physical life expectation of the asset or the period to the end of the life span of the generation plant.

The use of life span dates for determining depreciable lives for regulated electric generation plant is common throughout many North American regulatory jurisdictions. The basis for the determination of the life span date is usually based on one or more of the following:

- the physical life estimation of the major and vital components of the generating plant;
- the duration of operating licenses;
- precedent and policy of the regulatory jurisdiction;
- expiration of the supply source for which the generation plant is dependent; and
- expiration of market demand upon which the generation plant is dependent.

OPG's regulated hydroelectric stations do not require an end of life date as there are currently no factors reasonably expected to limit their life. With regular maintenance and replacement of components, hydroelectric stations, including associated civil structures, are typically expected to operate for very long periods.¹⁰ All sites currently in service are expected to generate hydroelectric service for the foreseeable future and there is no plan to remove any of these sites.

3.3 Average Service Life Assessments

Concentric has reviewed the average service life estimates for all regulated hydroelectric generation plant and asset categories, based on December 31, 2018 asset values. The service life estimate recommendations were based on informed professional judgment which incorporated a review of management's plans, policies and outlook, a general knowledge of the electric industry, and comparisons of the service life estimates from our studies of other peer electric companies.

Based on the review, Concentric supports continued use of the average service lives as set out in Section 4, Table 1 of this study. This represents OPG's currently approved average service lives (inclusive of the draft results of the 2019 DRC process), with recommended changes to the life estimates of the following three accounts.

¹⁰ Although dams can be considered a life-limiting component for hydroelectric generating facilities, in practice this does not result in an establishment of a specific life span date as the dams are expected to be in use for the foreseeable future with regular maintenance.



ACCOUNT 10205000 – HYDROELECTRIC – OUTDOOR STRUCTURES

2018 Gross Book Value	Investment %	Previously Approved Life	Concentric Recommended Life
\$57,436,693	0.60%	75	70

The 2013 Report recommended a 75-year average service life for this asset class. A peer comparison of Canadian hydroelectric generation utilities produced a range from 50- 100 years. Outdoor structures built by OPG are constructed to a very high standard and some larger structures were built early in the twentieth century, indicating that a life on the longer end of peer utilities may be appropriate. This account was reviewed by the DRC in 2017, which recommended maintaining the 75-year average service life. At this time, Concentric recommends shortening the life of this account to 70 years in recognition of the generally shorter lives in use by peer utilities.

ACCOUNT 1050200 – HYDROELECTRIC – BUS, SWITCHING AND POWER CABLE

2018 Gross Book Value	Investment %	Previously Approved Life	Concentric Recommended Life
\$155,932,455	1.62%	45	50

The 2013 Report recommended a 45-year average service life for this asset class. A peer comparison of Canadian hydroelectric generation utilities produced a range from 45-60 years. The DRC reviewed this account in 2018 and recommended maintaining a 45-year life. At this time, Concentric recommends lengthening the life of this account to 50 years based on the results of the operational interviews, Concentric’s experience and the longer lives generally in use by peer utilities.

ACCOUNT 1050500 – HYDROELECTRIC – STATION SERVICE ELECTRICAL EQUIPMENT

2018 Gross Book Value	Investment %	Previously Approved Life	Concentric Recommended Life
\$114,910,728	1.19%	50	45

The 2013 Report recommended maintaining the currently approved 50-year average service life for this asset class. A peer comparison of Canadian hydroelectric generation utilities produced an estimate of 25 – 40 years. The DRC reviewed this account in 2017 and recommended maintaining a 50-year life. Concentric recommends shortening the life of this account to 45 years based on the results of the operational interviews and the shorter lives generally in use by peer utilities.



SECTION 4

4 RESULTS OF STUDY

4.1 Results

The following tables provides a summary, by each asset group, of the net book value as of December 31, 2018 and the recommended average service life of each asset group.

Ontario Power Generation Inc.

**TABLE 1 - ORIGINAL COST, AND ANNUAL DEPRECIATION ACCRUALS
RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2018
DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

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Asset Class #	Description	December 31, 2018 NBV	Current	Recommended
10100000	Hydroelectric - Land improvements	\$ 14,407,989	100	100
10101000	Hydroelectric - Excavation, Dredging, Riprapping, Grouting	\$ 2,131,015,454	100	100
10110000	Hydroelectric - Land - pre - 1999	\$ 26,671,857	100	100
10200000	Hydroelectric - Substructures and Superstructures	\$ 1,144,705,917	100	100
10201000	Hydroelectric - Roofing	\$ 16,102,022	30	30
10202000	Hydroelectric - Fencing	\$ 4,838,650	25	25
10205000	Hydroelectric - Outdoor Structures	\$ 49,236,487	75	70
10210000	Hydroelectric - Service and Equipment Buildings	\$ 86,861,765	55	55
10300000	Hydroelectric - Canal, Forebay, Retaining Wall Lining	\$ 174,318,384	75	75
10301000	Hydroelectric - Lining of Tunnels and Permanent Shafts	\$ 200,622,190	75	75
10301100	Hydroelectric - Lining of Tunnels and Permanent Shafts (90Y)	\$ 339,743,890	90	90
10302000	Hydroelectric - Spillways, Sluices, Flumes	\$ 64,361,927	75	75
10302100	Hydroelectric - Public Safety/Warning Booms	\$ 8,145,428	10	10
10306000	Hydroelectric - Surgetank, Pipeline, Conduit, Penstock	\$ 277,261,921	90	90
10311000	Hydroelectric - Dams-Earth and Rockfill	\$ 127,359,497	100	100
10312000	Hydroelectric - Dams - Concrete	\$ 934,974,503	100	100
10315000	Hydroelectric - Steel Racks	\$ 9,869,323	40	40
10318000	Hydroelectric - Gates, Stoplogs and Operating Mechanisms	\$ 390,712,761	50	50
10400000	Hydroelectric - Turbines and Governors	\$ 202,873,048	70	70
10405000	Hydroelectric - Turbine Runners	\$ 104,473,241	40	40
10500000	Hydroelectric - Main Rotating Elect'l Plt - Windings	\$ 109,257,583	45	40
10501000	Hydroelectric - Main Rot' Elect'l Plt-Mach less Wdg	\$ 221,658,415	100	100
10502000	Hydroelectric - Bus, Switching and Power Cable	\$ 98,545,793	45	50
10503000	Hydroelectric - High Voltage Switching	\$ 15,525,416	40	40
10503100	Hydroelectric - Revenue Metering - HV Swtchg, Cntrl Brds/Swtchbrds	\$ 8,882,922	30	30
10504000	Hydroelectric - Control Boards and Switchboards	\$ 85,398,067	25	25
10505000	Hydroelectric - Station Service Electrical Equipment	\$ 63,254,462	50	45
10510000	Hydroelectric - Main Power and Station Service - Tran	\$ 195,341,666	50	50
10531000	Hydroelectric - Circuit Breakers	\$ 3,317,153	50	50
10601000	Hydroelectric - Mechanical Equip - Cranes and Followers	\$ 67,506,341	55	50
10700000	Hydroelectric - Auxiliary Systems	\$ 62,140,686	30	30
10709000	Hydroelectric - Owned Bridges, Railway Trk, Wharves	\$ 59,147,804	65	65
10710000	Hydroelectric - Fire Protection Systems	\$ 14,456,848	20	20
10720000	Hydroelectric - Electronic Security Systems	\$ 1,167,178	20	20
10991000	Hydroelectric - Major / Strategic Spares	\$ 9,483,972	40	40
11200000	Transfer and Distribution Stations - Buildings	\$ -	55	55

Ontario Power Generation Inc.

**TABLE 1 - ORIGINAL COST, AND ANNUAL DEPRECIATION ACCRUALS
RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2018
DEPRECIATION RELATED TO RECOVERY OF ORIGINAL COST OF INVESTMENT**

Filed: 2025-12-12
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Asset Class #	Description (1)	December 31, 2018 NBV (3)	Current	Recommended
11670000	Transfer and Distribution Stations Supv Control	\$ -	13	13
16100000	Admin and Service Buildings - Lands	\$ 591,758	0	0
16210000	Admin and Service Buildings - Perm Bldgs,Roads, Site Imp	\$ 6,778,923	50	50
16211000	Admin and Service Buildings - Buildings - Leased	\$ 696,388	10	10
16230000	Admin and Service Buildings - Buildings- Frame & Metal Clad	\$ 179,564	25	25
16540000	Admin and Service Buildings - Administrative Telecomm Equip	\$ -	7	7
16550000	Admin and Service Buildings - LAN Cable	\$ 930,398	10	10
16551000	Admin and Service Buildings - LAN Elect Connecting Devices	\$ -	5	5
16560100	Admin and Service Buildings - Intangibles Admin Sys Software	\$ 1,270,007	5	5
16630000	Admin and Service Buildings - Building Systems & Equipment	\$ 634,745	20	20
18100000	Communications - Land	\$ 794	100	100
18200000	Communications - Buildings	\$ 43,562	50	50
18400000	Communications - Power Line Carrier Equip etc...	\$ 263,067	15	15
18440000	Communications - System Control Comp Equipment	\$ 94,422	7	7
18460000	Communications - Data Acq Equip, Man Mach Intf Equ	\$ 2,596,226	15	15
18500000	Communications - Radio Equipment	\$ -	15	15
18530000	Communications - Timber & Steel Struct & Footings	\$ 11,296	40	40
18540000	Communications - Administrative Telecomm Equip	\$ 357,075	7	7
18541000	Communications-Admin Teleco Equip-Revenue Metering	\$ -	7	7
18600000	Communications - Wood Pole, Comm Cab, Appar&Booths	\$ 44,298	40	40
18630000	Communications - Optical Wire	\$ 421,469	25	25
18633000	Communications - Optical Wire - Revenue Metering	\$ 478,623	30	30
18700000	Communications - Power Supply Equipment	\$ -	15	15
COMP1	Computers (Minor Fixed Asset)	\$ 65,226	5	5
OFFICE1	Office Furniture and Fixtures (Minor Fixed Asset)	\$ -	3	3
SERV1	Service Equipment (Minor Fixed Asset)	\$ 2,197,226	10	10
T&WE1	Transportation and Work Equipment (Minor Fixed Asset)	\$ 853,454	10	10
TOTAL PLANT		\$ 7,342,149,079		

Numbers may not add due to rounding.

Filed: 2025-12-12
 EB-2025-0297
 Exhibit F4
 Tab 1
 Schedule 1
 Table 1

Table 1
Depreciation and Amortization - Regulated Hydroelectric (\$M)

Line No.	Prescribed Facility Category ¹	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Budget	2026 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	Niagara Region	60.2	60.2	60.5	61.5	61.3	61.3	63.3	65.1	65.6	68.3	68.5
2	Eastern Region	63.1	62.5	63.5	65.9	65.4	66.6	69.7	73.7	78.6	86.3	90.6
3	Western Region	16.5	16.3	16.7	17.5	18.3	18.5	21.4	22.5	24.1	23.4	24.5
4	Other ²	5.4	1.3	5.2	2.4	3.1	7.0	8.3	11.8	5.8	12.7	11.1
5	Total	145.2	140.2	145.9	147.3	148.1	153.4	162.7	173.1	174.1	190.8	194.8

Line No.	Prescribed Facility Category ¹	2027 Plan	2028 Plan	2029 Plan	2030 Plan	2031 Plan
		(a)	(b)	(c)	(d)	(e)
6	Niagara Region	70.2	72.9	82.7	89.3	93.6
7	Eastern Region	96.6	102.2	108.4	112.2	114.9
8	Western Region	29.5	33.5	38.9	41.9	44.5
9	Other ²	19.1	19.8	19.7	20.3	18.7
10	Total	215.4	228.4	249.6	263.6	271.7

Notes:

- 1 Operating Region descriptions effective 2021 (see Ex. A1-4-2).
- 2 Includes losses on retirements, gains on disposal and other related charges.

Numbers may not add due to rounding.

Filed: 2025-12-12
 EB-2025-0297
 Exhibit F4
 Tab 1
 Schedule 1
 Table 2

Table 2
 Depreciation and Amortization - Combined Nuclear (\$M)

Line No.	Prescribed Facility Category	2020 Actual	2021 Actual	2022 Actual	2023 Actual	2024 Actual	2025 Budget	2026 Budget	2027 Plan	2028 Plan	2029 Plan	2030 Plan	2031 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
	OPG's Nuclear Facilities												
	Darlington NGS:												
1	Darlington NGS (excluding DRP)	74.4	82.8	93.9	105.2	126.2	145.3	158.5	178.6	219.6	242.6	283.8	336.0
2	Darlington Refurbishment Program (excluding D2O Storage)	123.2	184.6	184.7	226.1	271.8	311.4	373.3	398.5	398.5	398.4	398.0	398.0
3	Heavy Water Storage Facility (D2O Storage) ¹	9.1	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
4	Subtotal Darlington NGS	206.7	279.5	290.7	343.3	410.0	468.8	543.8	589.1	630.1	653.0	693.7	746.0
	Pickering NGS:												
5	Pickering NGS (excluding PRP)	132.0	113.5	132.0	143.1	61.3	20.7	20.4	21.5	26.6	26.8	34.4	41.6
6	Pickering Refurbishment Project	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.8	4.1	4.1	4.1	156.7
7	Subtotal Pickering NGS	132.0	113.5	132.0	143.1	61.3	20.7	21.6	25.3	30.7	30.9	38.5	198.3
8	Operations and Project Support	26.7	30.4	33.4	37.3	41.8	39.5	40.9	37.5	36.4	35.1	36.3	36.9
9	Asset Retirement Costs	82.2	80.4	160.9	160.9	238.8	11.3	11.3	11.3	11.3	11.3	11.3	11.3
10	Other²	1.1	1.0	9.7	1.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Total	448.6	504.8	626.6	685.6	753.7	540.3	617.7	663.3	708.5	730.3	779.8	992.6
	DNNP Facilities												
12	Darlington New Nuclear Program	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6	109.7

Notes:

- 1 Amount in line 3 of col. (a) corresponds to EB-2020-0290 Payment Amounts Order, App. A, Table 10a, line 4a of col. (e) and reflects the OEB's findings with respect to the D2O Storage Project in the EB-2020-0290 Decision and Order dated November 15, 2021.
- 2 Includes losses on retirements, gains on disposal and other related charges.