# DARLINGTON REFURBISHMENT PROGRAM OVERVIEW

## 1.0 PROGRAM SUMMARY

The Darlington Refurbishment Program (the "Program" or "DRP") is a multi-year, multi-phase mega-project that will enable the Darlington Generating Station ("Darlington") to continue safe and reliable operation until approximately 2055. The Program includes the replacement of life-limiting critical components, the completion of upgrades to meet applicable regulatory requirements, and the rehabilitation of components at Darlington's four units. The Program is comprised of individual projects of various scales and sizes that will be executed during multi-year outages on each of the four units.

The Program began in 2007 and is being completed in three Phases, Initiation (2007-2009), Definition (2010-2015), and Execution (2016-2026). In its previous rate application (EB-2016-0152), OPG provided evidence that it had completed the Definition Phase of the Program, that all major contracts required to execute the scope of the Program had been awarded, and that the detailed planning conducted by OPG and its contractors had enabled the development of a four-unit budget and schedule for the successful execution of the Program, known as the Release Quality Estimate ("RQE"). The RQE was finalized in November 2015 and established a four-unit, program-level control budget of $12.8B that serves as the baseline against which the success of the Program is being measured.[1] The RQE was the basis upon which OPG's Board of Directors granted approval to proceed from the Definition Phase to the Execution Phase of the Program in November 2015, the basis of the Province's announced endorsement of the Program on January 11, 2016, and the basis of OPG's pre-filed evidence in EB-2016-0152.[2]

[1] The impact of the COVID-19 pandemic in 2020 on the cost and schedule for the Program could not have been foreseen at the time of the RQE. OPG deferred the start date of the Unit 3 refurbishment in 2020 in response to the pandemic and correspondingly revised the start dates for Units 1 and 4, and is tracking the incremental costs associated with the pandemic separately. See additional discussion of the COVID-19 impacts on pages five through eight of this exhibit as well as in Exhibits D2-2-5, D2-2-6, and D2-2-7.

[2] https://news.ontario.ca/en/release/35478/ontario-moving-forward-with-nuclear-refurbishment-at-darlington-and-pursuing-continued-operations-at.html

Subsequent to the RQE, and prior to the start of the Unit 2 refurbishment outage, as planned, OPG completed a more refined estimate of the cost and schedule for refurbishing Unit 2 and a corresponding update to the Program budget and schedule, known as the Unit 2 Execution Estimate ("U2EE"), in August 2016. The U2EE was the basis upon which OPG's Board of Directors granted approval to proceed with the execution of the Unit 2 refurbishment outage. The U2EE maintained the four-unit, program-level control budget of $12.8B. The U2EE was provided to the OEB in EB-2016-0152, in response to a Board Staff interrogatory (EB-2016-0152, Ex. L4.3-1 Staff-055). OPG did not update its revenue requirement in EB-2016-0152 to reflect the U2EE, and the OEB agreed with this approach, as the impact of any differences would be captured in the Capacity Refurbishment Variance Account ("CRVA"). The U2EE is the baseline against which OPG measured its performance during the execution of the Unit 2 refurbishment.

In its EB-2016-0152 application, OPG provided evidence that it had established the appropriate organization, project controls, change management and oversight to manage, control, report on, and take corrective actions, as required, to be able to provide high confidence of completing the Program safely, on budget, on schedule and with the required quality. OPG sought and received approval from the OEB for in-service additions of $4,800.2M related to Unit 2 (including the Definition Phase) in 2020 and 2021, as well as $377.2M related to Unit Refurbishment Early In-Service projects, Facilities & Infrastructure Projects ("F&IP") and Safety Improvement Opportunities ("SIO"), for a total of $5,177.4M.[3] The $377.2M in-service additions for Early In-Service projects, SIO and F&IP were distributed over 2016 (the bridge year in the EB-2016-0152 application) to 2021.

[3] Early-In-Service projects are those that provide benefit to the station prior to the return-to-service date of the nuclear unit under refurbishment. Examples include in-plant modifications which are of immediate benefit to multiple or all units.
F&IP are projects that do not involve the refurbishment of units but which are necessary to enable execution of the unit refurbishments and are expected to be useful to OPG's current and future nuclear operations independent of the DRP. A number of the F&IP involve upgrades to Darlington site infrastructure to ensure it can effectively support continued operations for 30 or more years. To meet required in-service dates, OPG commenced the F&IP work early in the Definition Phase of the Program.
SIO are initiatives which OPG committed to in the Environmental Assessment ("EA") for the DRP, primarily to address beyond-design-basis or four-unit events. The need for this work was established through the EA, which was filed with the Canadian Nuclear Safety Commission ("CNSC"). To meet required in-service dates, OPG commenced execution of SIO work early in the Definition Phase of the Program.

In its Decision and Order for EB-2016-0152, the Board stated the following:

> The OEB finds that the planning undertaken by OPG for the DRP was reasonable. The OEB notes that both experts agreed that the planning for the DRP had been conducted according to industry standards. The OEB finds that OPG has developed reasonable project control systems to manage the cost and schedule of the DRP. OPG also performed adequate risk assessment for the project and put in place processes to address risks as they arise.
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> The OEB also finds that the oversight structure that OPG has designed to monitor the DRP appears appropriate. As previously discussed, there are multiple layers of oversight with respect to DRP that should allow OPG to react appropriately to potential issues. The oversight for the project includes both internal and external expertise and resources.[4]

The refurbishment outage of Unit 2 began on October 15, 2016 and was completed on June 4, 2020 when the unit was successfully returned to service. Compared to the U2EE, the refurbishment of Unit 2 was completed on budget at $3,417M.[5]

Relative to the OEB approved in-service amount in EB-2016-0152 of $5,177.4M for the refurbishment of Unit 2 (including the Definition Phase), Early-In-Service projects, F&IP and SIO, there is a forecast variance of $132.7M or 2.5%.

Ex. D2-2-2 provides an explanation of the variances against the two components which make up the $5,177.4M OEB approved amounts, i.e., the $4,800.2M for Unit 2 (including the Definition Phase), and the $377.2M for Early-In-Service projects, F&IP and SIO.

Ex. D2-2-9 provides a comparison of actual in-service amounts to OEB approved amounts in EB-2016-0152.

The successful completion of the Unit 2 refurbishment on budget and reasonably on schedule represented a significant achievement in mega-project execution for OPG.

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[4] OEB Decision and Order, EB-2016-0152, December 28, 2017, p. 36.
[5] Of the $3,417M final cost of Unit 2, $3,340.5M represents the capital in-service amount.

In EB-2016-0152, OPG outlined the use of the CRVA to record the revenue requirement impact of any differences between OEB approved amounts and actual in-service additions (and associated timing) to rate base for the DRP. Under the CRVA, if OPG were to experience a variance relative to OEB approved in-service amounts, a balance, either positive or negative, would be recorded in the CRVA. The OEB would review the prudence of any in-service amounts over the approved amounts prior to disposition.

In this application, OPG is not seeking inclusion of the variance against the EB-2016-0152 approved in-service additions in rate base for the purposes of setting payment amounts for the IR term. The revenue requirement impact of the variance would continue to be recorded in the CRVA. Further details regarding the proposed rate base treatment can be found in Ex. B1-1-1.

OPG also is not seeking clearance of DRP-related amounts in the CRVA in this application.[6] OPG proposes to defer the clearance of any such DRP-related amounts recorded in the CRVA (and inclusion of the variance against the EB-2016-0152 approved in-service additions in rate base) to a future application, which would allow an assessment of the recoverability of DRP-related variances, if any, in the context of the overall performance of the four-unit refurbishment, including the effectiveness of Lessons Learned and Strategic Improvements from the earlier unit refurbishments. OPG's proposed treatment of the variances is consistent with the DRP being a single mega-program as opposed to a collection of smaller projects. Further details regarding the CRVA balances are provided in Ex. H1-1-1, Section 5.6.

Since EB-2016-0152, in addition to successfully completing the refurbishment of Unit 2, OPG has completed detailed planning and preparations for the refurbishment of Unit 3 including

[6] Other than the D2O Storage Project (Ex. D2-2-10) and the impacts of capital cost allowance deductions arising from changes in income tax legislation since EB-2016-0152 (Ex. F4-2-1). OPG also did not seek recovery of DRP-related CRVA balances in its EB-2018-0243 application for disposition of deferral and variance account balances, meaning that none of DRP-related CRVA balances accumulated since January 1, 2016 have been sought for clearance to date.

the incorporation of Lessons Learned and Strategic Improvements,[7] and has also commenced the refurbishment of Unit 3. OPG has also advanced detailed planning for Units 1 and 4.

In this application, through exhibits D2-2-1 to D2-2-9, OPG provides an update on the progress of the DRP, and evidence to support its request for approval of in-service additions through 2026, relating to the refurbishment and planned return to service of Units 3, 1, and 4, collectively known as the "Remaining Units", as set out in Section 2.0.

More specifically, OPG's pre-filed evidence demonstrates that:

- OPG has successfully performed the Unit 2 refurbishment and returned the unit to service.
- OPG has performed the detailed planning that is necessary, including the incorporation of Lessons Learned from Unit 2 and the implementation of Strategic Improvements, to establish the High Confidence Schedule[8] and cost estimates for completing the refurbishment of the Remaining Units and the Program in 2026, safely and with quality.
- Excluding any ultimate impact of the COVID-19 pandemic, the total estimated cost for completing the Program remains within the baseline estimate of $12.8B, as established at the RQE. While the COVID-19 pandemic is currently estimated to have resulted in a $150M increase in Program costs, OPG will continue to monitor, assess and explore potential efficiencies during the execution of the Remaining Units' refurbishments in an effort to complete the Program, inclusive of COVID-19 cost impacts, within the $12.8B budget established at the time of the RQE. OPG is not seeking approval of any COVID-

[7] "Lessons Learned" refers to specific and detailed knowledge and experience gained during a process, project or activity which, when applied to the same or similar processes, projects or activities in the future, results in improved performance. "Strategic Improvements" are new approaches and/or innovative methods for planning and executing the Remaining Units' refurbishments that are being implemented in addition to Lessons Learned. See Ex. D2-2-3, Sections 4 and 5, for a detailed discussion of Lessons Learned and Strategic Improvements.

[8] The High Confidence Schedule for the refurbishment outage of a Darlington unit refers to the schedule OPG utilizes as the basis of its public commitments to stakeholders, including the Government of Ontario, the Independent Electricity System Operator, the OEB and others. This schedule includes contingency amounts quantified based on a detailed analysis of risks. OPG also utilizes another shorter schedule, known as the Working Schedule, for day-to-day management of the refurbishment outages and for measuring performance on the outages, allowing for early escalation of issues. For further discussion of the High Confidence and Working Schedules, please refer to Ex. D2-2-2, Ex. D2-2-3, and Ex. D2-2-5.

19 pandemic-related costs in this application, and none are included in the in-service additions presented. Any ultimate variance to the $12.8B caused by the COVID-19 pandemic would be tracked separately and addressed through the CRVA in a future proceeding.

- OPG has in place the resources, organization and processes necessary to execute the refurbishment of the Remaining Units, and to complete the Program in its entirety, safely, on time, on budget, and to the required quality level.
- The Government of Ontario, through its most recent Long-Term Energy Plan,[9] and through a specific endorsement to proceed with the refurbishment of Unit 3,[10] continues to support the completion of the Program.

The refurbishment outages of the Remaining Units are scheduled to take place over a total span of 73 months (September 2020 to October 2026), including 40 months for Unit 3, 38 months for Unit 1, and 37 months for Unit 4.

Chart 1 provides the planned start dates, end dates and durations per OPG's High Confidence Schedules for the refurbishment outages of Units 3, 1, and 4. As discussed further in exhibits D2-2-3, D2-2-5, D2-2-6, and D2-2-7, the schedules reflect the impact of OPG's response to the COVID-19 pandemic that resulted in a later start date of the refurbishment outage of Unit 3 in 2020 and correspondingly later start dates of the Units 1 and 4 refurbishment outages in subsequent years.[11] Consistent with the revised Program schedule, the refurbishment outage of Unit 3 began on September 3, 2020.

[9] Government of Ontario, *Delivering Fairness and Choice – Ontario's Long term Energy Plan 2017*, October 2017.
[10] Government of Ontario, Ministry of Energy News Release, and then MPP for Durham, Granville Anderson's, announcement at the Darlington Energy Centre, February 15, 2018.
[11] As a result of the deferred DRP schedule, OPG moved an outage from 2020 to 2021 and also added a regular planned outage in 2021 to support Unit 4 operation until its start of refurbishment. See Ex. E2-1-2 for further discussion.

**Chart 1: High Confidence Schedule Dates for Units 3, 1 and 4 Refurbishment Outages**

| | Start | End | Duration (Months) |
|---|---|---|---|
| Unit 3 | 3-Sep-2020 | 2-Jan-2024 | 40 |
| Unit 1 | 15-Feb-2022 | 18-Apr-2025 | 38 |
| Unit 4 | 15-Sep-2023 | 16-Oct-2026 | 37 |

Consistent with OPG's plans, OPG has further updated the Program budget and schedule and has completed the Unit 3 Execution Estimate ("U3EE"). The final update to the U3EE was completed in August 2020. The final U3EE included the schedule impacts of the COVID-19 pandemic on the Program, and is the baseline against which OPG and its Board of Directors will measure the company's performance during the execution of the Unit 3 refurbishment. The final U3EE serves as the underlying basis for the in-service amounts requested in this application.

Within the 2022-2026 period, Units 3, 1, and 4 are scheduled to be refurbished and placed in service in 2024, 2025, and 2026, respectively. The total budget to complete the refurbishment of these units is $6,604.2M, comprising of $6,444.4M[12] capital and $159.8M OM&A[13]. A simplified breakdown of the Remaining Units' estimate, based on the final U3EE, is provided in Chart 2 below.

[12] Of the$6444.4M capital, $6442.6M is being requested in this application for the 2022-2026 rate period. Capital costs of $1.9M for an early-in-service project associated with Unit 3 are forecast to be placed in-service in 2021.

[13] Of the $159.8M of OM&A costs, $110.5M is being requested in this application for the 2022-2026 rate period (Ex. F2-7-1). The remainder represents actual OM&A expenses in 2019 and forecast OM&A expenses in 2020 and 2021 on the Remaining Units.

**Chart 2: Simplified Breakdown of Total Remaining Units Estimate**

| Program Component | Remaining Units Total Cost ($M) | Remaining Units Total Cost (%) |
|---|---|---|
| Major Work Bundles | 4,389 | 66 |
| OPG Functional Support | 1,567 | 24 |
| Contingency | 647 | 10 |
| **Total Cost Estimate** | **6,604** | **100** |
| Note: Interest and Escalation are included each of the line items above | | |

The Program components listed in Chart 2 are as follows:

*Major Work Bundles* are logical groupings of work scope, each consisting of a number of individual projects, defined by OPG for purposes of effectively contracting work to OPG's contractors and assigning project management accountabilities. The work to be undertaken through the Major Work Bundles consists of the replacement and rehabilitation of components, inspections, and the completion of upgrades directly related to unit refurbishment. Consistent with what was presented in EB-2016-0152, the Major Work Bundles are: (1) Retube and Feeder Replacement; (2) Turbine Generator; (3) Fuel Handling and Defueling; (4) Steam Generator; and, (5) Balance of Plant.

*OPG Functional Support* refers to work carried out by groups within OPG's Program Management and Execution Management and Support organizations (referred to as "Functions"). The Functions provide a broad range of support that is critical for the success of the Major Work Bundles and the Program as a whole, including oversight, coordination, and integration among the various contractors and ongoing station operations. It is largely through the Functions that OPG performs its vital role as the Program owner, with overall responsibility for Program management, deliverables, costs and schedule, as well as full integration with the operating units in order to comply with all Canadian Nuclear Safety

Commission ("CNSC") regulations and safe work practices, including permits and work control, radiation protection, chemistry and environmental controls.

*Contingency* is an element of the cost estimate that is allocated to manage uncertainty and risk throughout the life of the Program, and which is expected to be spent based on OPG's in-depth assessment of Program risks and uncertainties that cannot be avoided or fully mitigated.

OPG has made quarterly status reports available to the public through its website since the start of refurbishment of Unit 2, and plans to continue this practice until the completion of the Program. The public report covers the four project pillars of safety, quality, cost and schedule. As well, in accordance with the OEB's Decision and Order in OPG's EB-2016-0152 application,[14] OPG has issued detailed annual reports to the OEB at the end of 2018, 2019, and 2020 on the progress of the Program during those respective years. The annual report to the OEB includes a range of measures of safety, quality, cost, and schedule performance. OPG will continue to issue annual reports to the OEB until the completion of the Program.

In Ex. D2-2-10, OPG separately provides evidence to support its request for approval of in-service additions associated with the Heavy Water Storage and Drum Handling Facility ("D2O Storage Project"). OPG completed this complex project in 2020 and it is expected to support all of the Remaining Units' refurbishments.

## 2.0 APPROVALS SOUGHT

In the EB-2016-0152 proceeding, the OEB granted envelope approval for OPG's in-service amount request for Unit 2.[15] Consistent with the OEB's approval for Unit 2 in EB-2016-0152, in the current application, OPG seeks the following OEB approvals for the DRP:

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[14] Ontario Energy Board, *Decision and Order, EB-2016-0152, Ontario Power Generation Inc.*, December 28, 2017.
[15] Ibid, p. 41

- In-service additions to rate base of a total of $6,442.6M comprised of: (i) $1.4M in 2023 for an Early In-service Project associated with Unit 1, (ii) $2,505.5M in 2024 on completion of the Unit 3 refurbishment (this includes $1.6M for an Early-In-Service Project associated with Unit 4); (iii) $1,907.3M in 2025 on completion of the Unit 1 refurbishment; and, (iv) $2,028.3M in 2026 on completion of the Unit 4 refurbishment; (see Ex. D2-2-9 for details). Should the total aggregate actual additions to rate base be different from the total forecast amount of $6,442.6M, the revenue requirement impact of the cost variance (and any associated timing variances) will be recorded in the CRVA and any amounts greater than the forecast will be subject to a prudence review in a future proceeding;
- OM&A expenditures of $24.2M for 2022, $23.6M for 2023, $29.3M for 2024, $25.0M for 2025, and $8.4M for 2026 (Ex. F2-7-1); and,
- Approval of cumulative additions to rate base of $494.7M associated with the D2O Storage Project, consisting of in-service additions of $160.0M in 2016, $320.9M in 2019, and $13.8M in 2020.[16]

## 3.0 EVIDENCE ROADMAP

OPG has approached the evidence for the Program in a similar manner to the evidence provided in its EB-2016-0152 application, so as to facilitate understanding of the planning and execution of the Remaining Units of the DRP.

OPG's evidence includes a review of performance on the Unit 2 refurbishment. The evidence describes OPG's robust Lessons Learned process, its incorporation of Strategic Improvements into the Remaining Units, and how these are expected to result in efficiencies. OPG's on-going risk assessment process and the schedule and cost estimates for the Remaining Units are all described. Also explained are adjustments to the Program's organizational structure designed to efficiently and effectively manage the overlapping refurbishment outages of the Remaining Units.

[16] OPG also seeks recovery of the portion of the CRVA balance as at December 31, 2019 related to the D2O Storage Project and the impact on DRP-related capital cost allowance deductions arising from changes in income tax legislation since EB-2016-0152, as discussed in Ex. H1-1-1.

The evidence describes OPG's control, reporting and oversight structures to ensure completion of the Program safely, on time, on budget and with quality. The evidence also re-iterates the need for the Program to comply with all CNSC regulatory requirements, as well as with provincial requirements for nuclear refurbishment as set out in the Province's 2013 and 2017 Long-Term Energy Plans ("LTEP").[17, 18]

The evidence is organized as follows:

- Ex. D2-2-1 (Program Overview) provides a summary of the Program, the approvals sought and a description of the relevant regulatory framework, including Ontario Regulation 53/05, the Province's Long-Term Energy Plan and the relevant requirements of the CNSC.
- Ex. D2-2-2 (Unit 2 Performance) summarizes OPG's performance on the refurbishment of Unit 2.
- Ex. D2-2-3 (Remaining Units Planning) describes the approach and the status of planning for the Remaining Units. The Lessons Learned process is described, and select examples of key Lessons Learned from the execution of the Unit 2 refurbishment are provided. Strategic Improvements are also described as are the reasons for these Strategic Improvements and the expected impacts on the Remaining Units.
- Ex. D2-2-4 (Contracts) describes OPG's commercial management approach as well as material amendments to the contracts governing each of the Major Work Bundles since EB-2016-0152.
- Ex. D2-2-5 to Ex. D2-2-7 (Remaining Units Schedule, Contingency, and Cost) describe the schedules, the updated contingency amounts and the updated cost estimates for the Remaining Units.
- Ex. D2-2-8 (Program Structure and Oversight) focuses on how OPG will manage the Remaining Units during both the planning and execution phases, including the drivers of organizational changes implemented since the RQE and the approaches to managing the overlapping planning and refurbishment outage periods. OPG's role as Program owner

[17] Government of Ontario, *Achieving Balance – Ontario's Long Term Energy Plan*, December 2013.
[18] Government of Ontario, *Delivering Fairness and Choice – Ontario's Long Term Energy Plan 2017*, October 2017.

and the manner in which OPG's various organizational units will manage circumstances that affect scope, schedule, cost and quality during planning and execution of the Remaining Units is recapped. Key controlling activities which will continue to enable OPG to effectively track progress and manage execution risk are also recapped. Finally, OPG's on-going Program Oversight structure (both internal and external oversight) is described.

- Ex. D2-2-9 (In-Service Amounts) describes the capital in-service additions for the Remaining Units and provides updates to the actual versus planned in-service amounts which were approved in EB-2016-0152 for Unit 2 refurbishment, Unit Refurbishment Early In-Service projects, F&IP and SIO, as well as applicable variance explanations.
- Ex. D2-2-10 (D2O Storage Project) explains the D2O Storage Project's function, history, planning, construction, commissioning, and cost. It demonstrates that the capital expenditures that OPG placed in service in 2016, 2019 and 2020 are reasonable and appropriate and should be included in OPG's rate base.
- Ex. D2-2-11 (Independent Studies) provides a summary of two independent expert reports prepared in support of OPG's evidence, and provides the final reports as attachments. The first is from Pegasus Global Holdings, Inc. which provided an assessment of OPG's project management approach and preparedness with respect to the refurbishment of the Remaining Units. The second is from Bates White Economic Consulting, which completed an estimate of the cost to design, engineer, construct and commission the as-built D2O Storage Project.

A detailed breakdown of the DRP evidence structure is provided as Attachment 1.

## 4.0 REGULATORY FRAMEWORK

### 4.1 Ontario Regulation 53/05

Ontario Regulation 53/05 includes certain provisions related to the treatment of DRP in the setting of OPG's payment amounts. These provisions, which are unchanged from EB-2016-0152, are summarized below:

- The need for the DRP has been established by the regulation. As set out in the regulation, in setting nuclear payment amounts during the period from January 1, 2017 to

the end of the DRP, the OEB shall accept the need for the DRP in light of the Ministry of Energy's 2013 LTEP and the related policy of the Minister endorsing the need for nuclear refurbishment.[19]

- If the OEB is satisfied that costs of the DRP were prudently incurred and financial commitments were prudently made, the OEB must ensure that OPG recovers its capital and non-capital costs and firm financial commitments incurred for the DRP.[20]

Additionally, Ontario Regulation 53/05 provides for a rate smoothing approach to setting OPG's payments amounts beginning on January 1, 2017 and ending when the DRP ends, as discussed in Ex. I1-3-2.[21]

### 4.2 Long Term Energy Plans

Ontario's December 2013 LTEP stated: "[t]he government is committed to nuclear power. It will continue to be the backbone of our electricity system, supplying about half of Ontario's electricity generation."[22] The December 2013 LTEP further stated:

> The government will ensure a reliable supply of electricity by proceeding with the refurbishment of the province's existing nuclear fleet taking into account future demand levels. Refurbishment received strong, province-wide support during the 2013 LTEP consultation process. The merits of refurbishment are clear:
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> - Refurbished nuclear is the most cost-effective generation available to Ontario for meeting base load requirements.
> - Existing nuclear generating stations are located in supportive communities, and have access to high-voltage transmission.
> - Nuclear generation produces no greenhouse gas emissions.[23]

The December 2013 LTEP sets out a number of principles with respect to the nuclear refurbishment process.[24] As provided in EB-2016-0152, Ex. D2-2-1, Attachment 2, OPG's

[19] O. Reg. 53/05, s. 6(2), para. 12(v).
[20] O. Reg. 53/05, s. 6(2), para. 4.
[21] O. Reg. 53/05, s. 5.5 and s. 6(2), paras. 12(i) and (ii).
[22] Government of Ontario, *Achieving Balance – Ontario's Long Term Energy Plan*, December 2013, p. 30.
[23] Ibid, page 29.
[24] LTEP, December 2013, page 29.

demonstrated that its plans for the DRP included a number of specific elements that aligned with the LTEP principles.

Ontario's 2017 LTEP re-iterated support for Ontario's nuclear refurbishment program with the following statements:

> The most cost-effective option for producing the baseload generation the Province needs is to refurbish Ontario's nuclear generating stations. Ontario is moving forward with the plans laid out in the 2013 LTEP to refurbish a total of ten units – four units at Darlington and six units at Bruce.[25]
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> Refurbishing these ten nuclear units will lock-in more than 9,800 MW of affordable, reliable, and emission-free capacity for the long-term benefit of Ontario.[26]

### 4.3 Ontario Government's Continued Support for DRP

In addition to issuing clear policy statements regarding the need for nuclear refurbishment, the Government of Ontario's support for the DRP was affirmed on January 11, 2016[27] where the Government of Ontario endorsed OPG's plan to refurbish the four Darlington units. Subsequently, the Government of Ontario endorsed OPG's decision to proceed with the refurbishment of Unit 3, in a news release dated February 15, 2018.[28]

In its 2019 Budget, the Government of Ontario stated:

> The government supports Ontario Power Generation's (OPG) refurbishment project to extend the operating life of the four-unit Darlington Nuclear Generating Station. The Darlington Refurbishment project continues to track on time and on budget and, when finished, will generate low-cost, carbon-free and reliable energy for the people of Ontario for another 30 years.[29]

### 4.4 CNSC Regulatory Framework

As provided in EB-2016-0152, the CNSC exercises ongoing regulatory and licensing oversight over nuclear power plants in Canada. Continued operation of Darlington is largely dependent on the work that is required for long term safe operation. OPG is required to

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[25] Government of Ontario, *Delivering Fairness and Choice – Ontario's Long Term Energy Plan* 2017, p.45.
[26] Ibid.
[27] See footnote 2.
[28] See footnote 10.
[29] Government of Ontario, 2019 Budget, p. 92.

adhere to the requirements of the *Nuclear Safety and Control Act*, the *Canadian Environmental Assessment Act*, all associated regulations, and conditions under its operating license for Darlington. Regulatory requirements are included in the scope, schedule and costs of the Program.

In accordance with CNSC regulations,[30] during the Definition Phase, OPG systematically identified all environmental and safety concerns. This was accomplished through the preparation of an Environmental Assessment ("EA"), an Integrated Safety Review (“ISR”), a Global Assessment Report (“GAR”) and an Integrated Implementation Plan (“IIP”). The IIP sets out OPG’s commitments to address the identified environmental and safety concerns. In December 2015, the CNSC ruled that OPG had completed an ISR, GAR and IIP in accordance with the regulatory requirements.

The current Darlington Nuclear Power Reactor Operating License became effective on January 1, 2016. In granting a renewed license in December 2015, the CNSC concluded that OPG is qualified to carry out the proposed refurbishment project. The CNSC provides regulatory oversight to ensure OPG’s compliance with the Power Reactor Operating License; this includes oversight of the Program.

OPG has worked closely with the CNSC to facilitate their oversight of the Program, to ensure that all requirements are satisfied and that regulatory issues would not impact the cost and schedule of the DRP. For example, OPG established a protocol with the CNSC in 2016 outlining what information will be provided and what reviews will be conducted, to ensure that regulatory approvals would not impact critical path.

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[30] Regulatory Document RD-360 (Life Extension of Nuclear Power Plants), later superseded by Regulatory Document REGDOC-2.3.3 (Periodic Safety Reviews) for a nuclear life extension project. The CNSC expects the licensee to demonstrate that the following objectives are met:

- The technical scope of the project is adequately determined through an IIP that takes into account the results of an EA and an ISR;
- Programs and processes that take into account the special considerations of the project are established; and
- The project is appropriately planned and executed.

As in other areas of the Program, OPG has carried out an in-depth Lessons Learned exercise and will implement regulatory process improvements on the Remaining Units to continue to provide high assurance that regulatory approvals will not impact critical path.

## ATTACHMENTS

Attachment 1: Detailed Breakdown of Evidence Structure