DARLINGTON NEW NUCLEAR PROGRAM CONTINGENCY

1.0 OVERVIEW

Risk management is a systematic approach for proactively identifying, analyzing, managing and responding to project risks.

OPG has implemented a comprehensive and robust risk management system for the Darlington New Nuclear Program ("DNNP"). A key product of this system is the contingency that is included in the Release Quality Estimate ("RQE") for Unit 1 / Common Scope Facilities ("Unit 1"). Contingency is an important tool for managing uncertainty and risk throughout the life of the project.

The process for developing the Unit 1 contingency is set out in this exhibit. The process used for managing contingency during the Execution Phase is described in Ex. D2-4-9.

2.0 CONTINGENCY

Determining the amount of contingency for a particular project is integral to the estimating, scheduling and risk management processes. Importantly, contingency refers to amounts that are expected to be expended because there are risks and uncertainties that will occur and that cannot be entirely mitigated or avoided.

Contingency is included as a component of a project cost estimate just like any other cost component. It is not an extra amount that will not be spent if the project goes as planned, nor is it a tool to compensate for an underdeveloped project plan. It is a necessary, legitimate and thoughtfully developed part of the estimated project cost based on residual (post mitigated) risk and uncertainty.

The Association for the Advancement of Cost Engineering International ("AACE"), a leading authority in the area of cost engineering, management and estimation, defines "contingency" as an amount that is added to an estimate to allow for items, conditions or events, for which the state, occurrence or effect is uncertain and that experience shows will likely result, in

aggregate, in additional costs. In addition, the AACE definition states that "contingency is generally included in most estimates and is expected to be expended."[1] Contingency is typically estimated using statistical analysis informed by judgment based on experience. It considers only residual (post-mitigated) risk exposures. Similarly, the Project Management Institute, a leading professional membership association for the project, program and portfolio management profession, explains that contingency allowances are part of the funding requirements for a project, necessary to account for cost uncertainty.[2]

OPG developed the Unit 1 estimate in accordance with AACE's recommended practices for estimate classification. As part of this approach, OPG identified and classified risks, and performed Monte Carlo simulation analysis based on industry best practices (including AACE guidelines). OPG used this risk quantification to inform the contingency components of the Unit 1 RQE.

OPG also engaged Better Through Total Collaboration ("BTTC"), a consulting company that specializes in assurance services for major capital projects, to conduct a third-party review and assessment of the governance, processes and procedures used to develop the RQE, including the contingency component.

For the risk management component of the RQE, BTTC concluded that DNNP has "...demonstrated not only alignment to AACE best practice, but execution of compliance over and above what is stated in their suite of risk Management Plans."[3]

In terms of process maturity, BTTC scored the contingencies component of the basis of estimate, the risk analysis and contingency component of the development process, and the and the entire risk management plan, including quantitative risk assessment, as "Effective". An "Effective" score means that "Leading practices have been incorporated into the specific

[1] "Cost Engineering Terminology", Recommended Practice 10S-90, AACE International, WV, rev. 2007.
[2] Project Management Institute, *Guide to the Project Management Body of Knowledge (PMBOK Guide)*, 4th ed., 2008, Section 7.1.2.6 at p. 173.
[3] Better Through Total Collaboration, "Third Party Assurance Report: Governance, Process and Procedures" (April 30, 2025), p. 7.

governance, process, and procedural areas, comprehensively addressing all recommendations outlined in industry best practice guidelines."[4]

In terms of compliance with the risk plans and controls, BTTC found that DNNP "...consistently met all requirements outlined in the relevant management plans. Controls were well-defined and actively followed, demonstrating effective implementation and oversight."[5]

For additional information on the BTTC report, and the report itself, see Ex. D2-4-8.

3.0 CONTINGENCY DEVELOPMENT

In order to determine the total contingency for Unit 1, OPG calculated contingency components for Integrated Project Agreement ("IPA") scope risks, non-IPA scope risks, execution profit-at-risk and warranty and Unplanned Capability Loss Factor ("UCLF") risk. While this structure differs somewhat from that typically used by OPG for major projects, it reflects the first-of-a-kind ("FOAK") nature of the project and the contractual model for the DNNP. The four contingency components are described below. Details of the IPA and underlying commercial framework are discussed in Ex. D2-4-3.

1. **OPG (Non-IPA) Scope Contingency:** Addresses the cost uncertainty, schedule uncertainty and discrete risks that are associated with executing the scope excluded from the IPA. This contingency was informed by the quantitative risk assessment process (described below) and is funded by OPG.

2. **IPA Scope Contingency:** Addresses the cost uncertainty, schedule uncertainty and discrete risks that are associated with executing the scope included in the IPA. This contingency was informed by the quantitative risk assessment process (described below) and is part of the agreed IPA. Under the terms of the IPA, this contingency is funded by OPG via the Reward Pool, specifically the Execution Sub-Pool.

[4] *Ibid.*, p. 4.
[5] *Ibid.*, p. 7.

3. **IPA Profit at Risk Pool:** This component leverages the Risk Pool funds available under the IPA, associated with execution. The execution Risk Pool was established to incentivize the Non-Owner Parties ("NOPs") to achieve the Unit 1 execution project objectives, including cost and schedule adherence. It is composed of the contributions from the agreed Fixed Fees of NOPs for execution scope, representing their profit and a share of their overheads.

   This amount in the Risk Pool will be drawn upon by the project to manage risks that arise during project execution, above and beyond the funds available from the Reward Pool. At completion of Unit 1, any remaining funds within the Risk Pool will be paid out to the NOPs in accordance with the IPA.

4. **IPA Warranty and Unplanned Capability Loss Factor Pool:** This component leverages both the IPA Reward Pool (funded by OPG) and the Risk Pool (funded by the NOPs' Fixed Fees) tied to warranty claims and UCLF. This Pool was established to incentivize the NOPs to achieve key operational objectives and performance measures. It will remain open for 36 months following mechanical completion.

3.1 Qualitative and Quantitative Risk Assessment

OPG has established a risk management team within the DNNP Project Management Office (refer to Ex. D2-4-2) and equipped them with the necessary tools to identify, develop, manage and monitor risks associated with the DNNP.

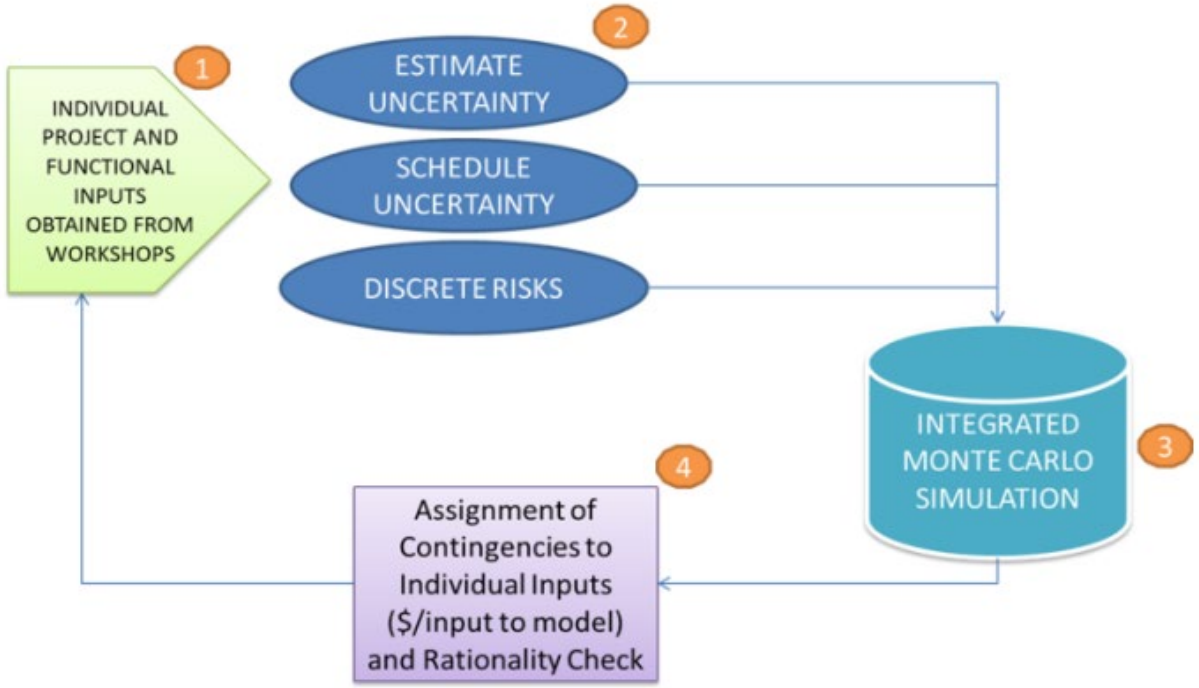
The contingency estimate was developed through a detailed evaluation of: (1) the uncertainties in estimating cost and schedule, (2) discrete risks relating to cost and schedule, and (3) contingent work across each project and the entire Unit 1. This process relied upon the use of both qualitative and quantitative methods, including an integrated cost and schedule Monte Carlo simulation.

- *Cost estimating uncertainty* is the possibility that the costs of the projects are more or less than the applicable estimates, taking into consideration the estimate classification of the base project cost (excluding discrete risk events).

- *Schedule estimating uncertainty* is the possibility that the actual schedule durations for the projects are more or less than the estimate durations (excluding discrete risk events).
- *Discrete risks* are the incremental cost and schedule impacts to the project baselines if risk events were to occur. These include risks that are specific and applied to individual bundles scope, such as delays to procurement of a specific component for a specific project, as well as global risks that could impact the DNNP in an overarching manner, such as with respect to the availability of sufficient skilled trades resources to execute the construction work program.

An illustration of the iterative process to gather, process, and refine the contingency inputs is shown in Figure 1 below.

Figure 1 –
Iterative Process for Gathering, Processing, and Refining Contingency Inputs



A comprehensive risk register including AACE estimate classifications for each scope and detailed schedule logic was used to develop the contingency estimate. The risk register was initially developed by subject matter experts from the Project Management Teams ("PMTs") and Functional Teams. It was then vetted through a series of challenge sessions to ensure reasonability and that the risks in the register are legitimate and being effectively managed. The NOPs and contract staff supported the contingency development process by developing the base cost and schedule estimates to approved AACE estimate classifications and by identifying risks that were added to the risk registers. OPG provided independent owner oversight to challenge inputs and drive reasonable outputs during these sessions.

The "cost uncertainty" and "schedule uncertainty" components of contingency were reviewed by the PMTs and Functional Teams in collaboration with individual subject matter experts in workshops and with reference to the AACE estimate classification and schedule durations. This practice of identifying and modeling the integrated effects of risk and uncertainty on schedule is an approach which is considered best practice and was successfully applied to the Darlington Refurbishment Program.

The contingency amount for the DNNP was established through a rigorous and systematic risk management process, drawing on industry best practices and lessons learned. OPG used @Risk, a leading risk analysis software tool from Palisade Corporation, an internationally recognized leader in this field.

A comprehensive risk identification exercise was undertaken, involving multidisciplinary teams to capture potential technical, regulatory, schedule, and supply chain risks. Each identified risk was then assessed for its likelihood and potential impact on both cost and schedule, with findings documented in a detailed risk register. Next, an integrated Monte Carlo simulation representing execution of the Unit 1 scope was conducted by OPG's risk management team. A Monte Carlo simulation is a computerized mathematical technique that replicates execution of the project thousands of times, accounting for the potential realization of risk events and uncertainties. It provides decision makers with a range of possible outcomes and the probabilities that those outcomes will occur to certain confidence levels.

A Monte Carlo simulation builds models of possible results by substituting a range of values for any factor that has inherent uncertainty. The model is then used to calculate the results in an iterative manner, involving thousands of iterations, each using a different set of random values from the probability functions.[6] The intent is to simulate the outcome of Unit 1 scope risk and uncertainty variables thousands of times and integrate these results to determine the contingency estimate confidence level. As a result, the RQE contingency estimate is a high confidence estimate based on the risk and uncertainty profile.

After initial contingency development workshops were completed and a preliminary contingency estimate was prepared, management reviews were held to validate the overall adequacy of the contingency estimate. This further ensured that the level of detail and the input of risks and uncertainties were reasonable.

4.0 CONTINGENCY AMOUNTS

The detailed evaluation of cost and schedule uncertainties and discrete risks, as well as the FOAK nature of the project and the IPA contractual framework, enabled OPG to determine the contingency amount to include in the Unit 1 RQE. The outcome of this analysis yielded that, at a high confidence level, the Unit 1 RQE should include $1.24B[7] (2024$) of total contingency and incremental protections, including the IPA incentive/disincentives. The components of this total contingency amount are set out in Chart 1 below.

Project contingency is derived from the individual discrete risks and cost uncertainties managed by PMTs or Functional Teams and have a localized project impact if they occur. The *Program contingency* is derived from overarching program risks managed at the executive level that could influence the overall DNNP's objectives, may require program-wide response and may have a global impact on the DNNP.

[6] Palisade Corporation, *Monte Carlo Simulation* <http://www.palisade.com/risk/monte_carlo_simulation.asp>.
[7] Escalation is excluded.

For a project the size, duration, and FOAK nature as the DNNP, there are several low probability, high consequence events that could impact the project and that are outside of the contingency amount in the RQE. Due to their low probability, these items would not contribute sufficiently to a probabilistic assessment used in establishing contingency. Examples of such events may include force majeure, a significant labour disruption, changes in the political environment, and unforeseen changes to financial and other economic factors beyond those assumed in the program. As a more direct example, in light of the volatility characterizing the current economic trade environment, the inclusion of tariffs in RQE calculations could result in either excessive or insufficient contingency. As such, tariffs were excluded on the basis of the high uncertainty for both their probability and impact. If such an event were to occur, Management would evaluate the cost and schedule consequences of the event and provide a recommendation to the Board of Directors for approval on the appropriate response.

A breakdown of the DNNP contingency amounts is set out below in Chart 1.

Chart 1 – Unit 1 Contingency by Component[1]

Component	Contingency ($M)
OPG (Non-IPA) Scope Contingency	193
IPA Scope Contingency	547
IPA Execution Profit at Risk	385
IPA Warranty and UCLF Risk and Reward	115
Total Contingency	**1,240**

[1] Note: Escalation is excluded.

A breakdown of the specific components of the Unit 1 Monte Carlo simulation results by Major Work Bundle, used to inform development of the contingency is provided in Chart 2, below.

Chart 2 – Unit 1 QRA Monte Carlo Simulation Results by Major Work Bundle

#	Bundle/Scope	IPA ($M)	Non-IPA ($M)	Total ($M)
1	Owner Program and IPD PMO	77	84	161
2	Site Preparation	0	0	0
3	Design Engineering	11	0	11
4	Nuclear Island	237	0	237
5	Conventional Island	166	0	166
6	Balance of Plant	58	0	58
7	Digital Strategy	0	(12)	(12)
8	Commissioning and Start Up	0	62	62
9	**Total Contingency[1]**	**550**	**134**	**684**

[1]Totals may not add due to rounding

The Monte Carlo simulation results related to the IPA scope produced a contingency estimate for Unit 1 of $550M at a 90% confidence level (often referred to as P90). This simulation result supported the establishment of the Execution Sub-Pool of the Reward Pool, set out in the IPA and funded by OPG, at a value of $547M. Under the terms of the IPA, the funds in the Execution Sub-Pool of the Reward Pool can be used to address risks that arise during project execution.

The Monte Carlo simulation results related to the Non-IPA scope produced a contingency estimate for Unit 1 of $134M at a 90% confidence level. Recognizing the FOAK nature of the technology, higher uncertainty, and limited relevant historical data to inform the risk profiles, OPG has allocated $193M to the contingency pool. Altogether, the level of OPG-funded contingency is supported by the Monte Carlo simulations.

In addition, OPG negotiated incremental cost protections that are funded by the NOPs through the Execution Sub-Pool of the Risk Pool funds available under the IPA. The Risk Pool was established to incentivize the NOPs to achieve the Unit 1 project objectives, including cost and schedule adherence during execution. It is composed of the contributions from the Fixed Fees of the NOPs, representing their profit and a share of their overheads. This amount in the Execution Sub-Pool of the Risk Pool will be drawn upon by the project to manage risks that arise during project execution that are above and beyond the funds available from the IPA

scope contingency.[8] Similarly, the Warranty and UCLF Risk and Reward pool components are included in the overall contingency for Unit 1. Details on the pricing and risk reward framework within the IPA is described in Ex. D2-4-3.

Authorization of the use of contingency funds is strictly controlled through the change management process, which requires an explanation of the risk or uncertainty element that has been realized and requires escalation for use of any contingency funds. Additional information regarding the change management process is found under Ex. D2-4-9.

The DNNP LP's proposed revenue requirement reflects the forecast Unit 1 DNNP in-service additions based on the cost and schedule in the RQE. As set out in Section 6.1 of Ex. H1-1-1, subject to Ontario Regulation 53/05, the difference between the revenue requirement impact of the actual costs incurred and firm financial commitments made for the DNNP and those forecast costs and firm financial commitments reflected in the 2027-2031 annual nuclear revenue requirements approved by the OEB in this proceeding will be recorded in the Darlington New Nuclear Project Variance Account re Development. As such, in the event of any unallocated contingency at the point of in-service, the favourable revenue requirement variance will be recorded in the account and returned to customers in a future period.

[8] Depletion of the Execution Sub-Pool of the Risk Pool will occur at 70% of the cost incurred, with the remaining 30% of the cost incurred funded by the Owner via the OPG (Non-IPA) Scope Contingency.