Q. **Reference: Life Extension Application, Schedule 1, page 22, lines 1-3.**

"It is an industry standard practice to include management reserve in project estimates especially for large complex projects."

a) Is Hydro aware of whether other Canadian regulatory jurisdictions have approved management reserve in capital project budget proposals? Provide details of approvals in other jurisdictions that incorporated management reserve.

b) Provide any information that Hydro may have on how, historically, management reserve has been used internally by Hydro and other utilities to quantify the risk associated with overspending budget estimates for major capital projects.

A. **a)** Legislated approval requirements differ within jurisdictions; some jurisdictions do not require capital budget applications prior to the execution of the project. However, British Columbia is an example of another Canadian jurisdiction where a management reserve is included in proposed and approved capital project budgets.

In British Columbia, large capital projects that exceed specified cost thresholds (or as directed by the British Columbia Utilities Commission ("BCUC")) are reviewed and approved separately, either through a Section 44.2 Expenditure Schedule or a Certificate of Public Convenience and Necessity ("CPCN") process. For the CPCN process, the BCUC's approved Major Capital Project Filing Guidelines for British Columbia Hydro and Power Authority ("BC Hydro") require application to the BCUC for major capital projects with authorized cost estimates that exceed certain thresholds.[1] The Authorized Cost is the requested funding for a project, inclusive of all contingencies and reserves and based on a fixed scope and in-service date. For example, in BC Hydro's application for a Certificate of Public Convenience

[1] British Columbia Hydro and Power Authority & British Columbia Utilities Commission, "2024 Major Capital Project Filing Guidelines," September 13, 2024, https://docs.bcuc.com/documents/other/2024/doc_78958_2024-09-13-bch-2024-major-capital-project-guidelines.pdf.

and Necessity for the 1L243 Transmission Load Increase (Highland Valley Copper) Project,[2] the Authorized Cost is defined as the estimated cost at the P90 confidence level, plus the Special Reserve. While the term Special Reserve is not utilized in Association for the Advancement of Cost Engineering ("AACE") documentation, footnote 27 of the Executive Summary to BC Hydro's application notes:

> Special Reserve is synonymous with Management Reserve in the AACE International Recommended Practice 10S-90, which is defined as "an amount added to an estimate to allow for discretionary management purposes outside of the defined scope of the Project, as otherwise estimated. It may include amounts that are within the defined scope, but for which management does not want to fund as contingency or that cannot be effectively managed using contingency.[3]

BC Hydro was successful in its application, with the BCUC finding that *"The Panel finds as reasonable BC Hydro's Authorized Cost estimate of $147.1 million that includes a project reserve of $23.5 million."*[4] Hydro further notes that the Decision and the Major Capital Project Guidelines direct BC Hydro to file material change reports when there is a change reasonably expected to have a significant impact on the schedule, cost, or scope of the project. A material change includes a circumstance where the Authorized Cost of the project is forecast to exceed the Authorized Cost that is part of the BCUC's Decision and Order granting a CPCN or accepting the capital expenditures schedule for a project.

b) Historically, Newfoundland and Labrador Hydro ("Hydro") has requested approval based on the expected cost of a project. For example, an AACE Class 3 estimate. Hydro's proposed Authorized Cost, which is the AACE Class 3 estimate combined with a management reserve, is a process that has been adopted for Hydro's major projects, including the 2025 Build Application and the Bay d'Espoir Unit 7 Life Extension.

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[2] British Columbia Utilities Commission, "Application for a Certificate of Public Convenience and Necessity – 1L243 Transmission Load Increase (Highland Valley Copper) Project," Proceeding No. 1243, https://www.bcuc.com/OurWork/ViewProceeding?applicationid=1243.

[3] British Columbia Hydro and Power Authority, "1L243 Transmission Load Increase (Highland Valley Copper) Project," May 23, 2024, https://docs.bcuc.com/documents/proceedings/2024/doc_77349_b-1-bch-1l243-transmissionloadincrease-highlandvalleycopper-project-application-public.pdf.

[4] British Columbia Utilities Commission, "Order Number C-1-25," February 12, 2025, p. 18 of 34, https://docs.bcuc.com/documents/other/2025/doc_80136_c-1-25-bch-cpcn-1l243-load-increase-highland-valley-copper-project-final.pdf

Management reserve is an essential tool for proponents, including utilities, in managing risk, particularly in the context of major capital projects. As noted in Hydro's response to part a) of this response, management reserve is added to an estimate to allow for discretionary management purposes, including to account for strategic risks.

Utilities face the challenge of large-scale infrastructure projects, such as builds or upgrades to their vital assets. These projects can span years and face a variety of risks, including:

- **Regulatory Changes:** Shifts in government policy, environmental laws, or safety regulations that could alter project scope or introduce unexpected costs.
- **Geotechnical or Environmental Uncertainties:** Unforeseen ground conditions, environmental issues, or severe weather-related delays.
- **Technical Complexity:** New technologies or innovations that were untested and could lead to higher-than-expected costs.
- **Supply Chain Issues:** Fluctuations in the prices of raw materials, labour shortages, or disruptions in the supply of key components.
- **Labour and Equipment Availability:** Competing projects and other supply chain restrictions, and an aging workforce can reduce the availability of equipment and labour.

To manage these types of risks, utilities began to adopt the practice of setting aside management reserves, which would only be utilized after a thorough review and when the risk materialized into actual cost increases.

A utility uses a management reserve to quantify and manage strategic risks on major capital projects. The management reserve represents a portion of the total project budget that covers unforeseen or residual risks beyond those already addressed through project-level contingencies.

Hydro's management reserve, as with other utilities, for example BC Hydro and Manitoba Hydro,[5] is established using a probabilistic cost risk analysis rather than a fixed percentage. Hydro worked to ensure it had a thorough understanding of the risks associated with each project and created a fulsome risk register for each project. Project risks were then considered in the establishment of each project budget. The identification and quantification of risk was undertaken by subject matter experts, and a quantitative risk analysis using a Monte Carlo simulation was employed to develop contingency and management reserve values which account for the risks identified. The analysis produces a probability distribution of possible total project costs (e.g., P50, P75, P90 values).

The project's baseline cost estimate is typically aligned with the P50 value (the median expected cost). The management reserve is then set equal to the difference between the P85 outcome and the P50 baseline—representing the additional amount required to achieve an 85% confidence level that the total budget will be sufficient to complete the project.

The P85 confidence level used by Hydro was the level recommended by Commissioner LeBlanc in the Muskrat Falls Inquiry Report. BC Hydro has used P90 in many of its applications, including the one referenced in part a) of this response. This level is selected to establish the management reserve because it reflects a prudent balance between cost certainty and funding efficiency. In a probabilistic cost risk analysis performed for each major project, the P85 or P90 outcome represents the point at which there is an 85% or 90% probability that total project costs will not exceed the approved budget.

This confidence level aligns with established industry practice. Selecting the P85 outcome provides a high degree of assurance that sufficient funds will be available to complete the project while minimizing the likelihood of cost overruns that could impact ratepayers.

The choice of P85 or P90 also reflects the complexity and risk profile of the utility's major capital projects, many of which involve significant engineering, environmental, and schedule

[5] Manitoba Hydro, "Appendix 2.4 – Developing the Keeyask and Conawapa Capital Cost Estimates," August 2013, https://www.pubmanitoba.ca/nfat/pdf/hydro_application/appendix_02_4_developing_the_keeyask_and_conawapa_capital_cost_estimates.pdf.

risks. A higher confidence level is therefore appropriate to ensure that overall budget adequacy is maintained under uncertainty.

For Hydro, the utilization of management reserve follows a structured and controlled Project Change Management process. Potential changes must be evaluated from many perspectives, justified and presented to a change control committee. Once this committee agrees with the rationale for the change, the change follows a graduated and auditable authorization process through various levels of Hydro management, including Hydro Executive. As part of Hydro's Governance Framework, the authorization for spending management reserve that falls outside of the planned project budget requires approval from Hydro's Chief Executive Officer.

This approach allows the utility to explicitly quantify its exposure to risk, align funding levels with a chosen confidence threshold, and maintain transparent governance and reporting around reserve usage.

The management reserve equips management so they can respond to strategic risks or unforeseen events quickly, and not further negatively impact the schedule and therefore cost of the project. Delays in the project schedule can result in significant increases in the costs of the project, and thus the costs to customers. By having the Authorized Cost approved by the Board of Commissioners of Public Utilities, Hydro will not be required to initiate further process to obtain approval to address the unforeseen events; rather, projects can continue to advance and remain on schedule despite obstacles outside of Hydro's control.