

- 1 Q. **Reference: Application, 2023 Capital Budget Overview, Appendix F and pages 34-37**
- 2 a) What was the rationale or precedent for the assignment of index values for likelihoods in  
3 the NLH Capital Risk Rating Matrix as 1, 2, 3, 4 and 5? The index value of 1 corresponds to a  
4 probably of less than 1 per cent while the index value of 5 corresponds to a probably of  
5 greater than 90 per cent, which is more than 90 times higher, so isn't using 5  
6 underweighting the probably of a likely event in relative terms? Has Hydro considered using  
7 the mid-point of each of the 5 categories to reflect the probabilities associated with them,  
8 e.g., index number 4 corresponds to 50 to 90 per cent so why not use the midpoint of 70 per  
9 cent, thereby preserving the mathematical relationship among the probabilities?
- 10 b) What was the rationale or precedent for the assignment of index values for impacts in the  
11 NLH Capital Risk Rating Matrix as 1, 2, 3, 4 and 5? While there is not an exact mathematical  
12 relationship among the impacts, isn't an assigned index value of 3 for a "moderate" impact  
13 (where more than 1000 customers are affected) too low relative to a "very-low" impact  
14 event (where fewer than 100 customers are affected)?
- 15 c) Tables 8 and 9, pages 34-37, give very different priority rankings depending on whether the  
16 criterion is risk mitigation per \$1 million (Table 7) or risk mitigated (Table 8), e.g., Overhaul  
17 of Unit 2 Turbine and Valves (2023) – Holyrood ranks 59 out of 62 projects/programs when  
18 the evaluated by risk mitigation per \$1 million while it ranks first among the 62 according to  
19 risk mitigated. Is it possible that these very different rankings are due to a lack of  
20 proportionality in the index values used in the Rating Matrix?
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- 23 A. a) In developing its Capital Risk Evaluation Matrix, Newfoundland and Labrador Hydro  
24 ("Hydro") leveraged its existing Enterprise Risk Management Matrix, which is the precedent  
25 for the likelihood index values utilized in Hydro's application. A 5x5 risk matrix often utilizes  
26 qualitative likelihood index values (e.g., rare, possible, likely). In order to facilitate consistent  
27 likelihood scoring, Hydro established guideline probability ranges to define these categories.  
28 Hydro recognizes that the probabilities associated with each likelihood value are non-linear;  
29 however, Hydro also recognizes that the probability of failure of aging assets is also non-

1 linear. Therefore, Hydro's likelihood index values provide guidance in estimating the  
2 likelihood of failure of its assets. Hydro's capital risk evaluation practices are subject to  
3 continuous improvement, including improvements to be identified and implemented  
4 through Hydro's Asset Management Improvement Plan. Hydro may adopt different  
5 likelihood index values should it determine that there is meaningful value in doing so and  
6 that the cost of implementation is warranted.

7 **b)** Hydro recognizes that the guideline factors for determining risk impact index values as  
8 identified in its Capital Risk Evaluation Matrix are not linear or mathematically proportionate  
9 in some cases. This is in part due to Hydro's efforts to ensure its risk evaluations are fair and  
10 practical. Hydro utilizes a 5x5 risk evaluation matrix, which it has observed to be the matrix  
11 dimension typically used in industry. Hydro manages a wide variety of assets with highly  
12 divergent sizes and with impacts ranging from system-level impacts (e.g., loss of generating  
13 reserves resulting in widespread outages versus the loss of a distribution feeder resulting in  
14 impacts to a comparatively small group of customers). As such, Hydro's risk evaluation  
15 matrix must allow Hydro to differentiate between this wide range of potential impacts. A  
16 project associated with a relatively large distribution system would receive an impact score  
17 of three whereas a project associated with Hydro's largest generating assets would receive  
18 an impact score of five. While a larger matrix would provide additional granularity and may  
19 allow risk scoring that is more proportionate, such granularity comes at the cost of  
20 increased complexity resulting in significantly more data, time, and effort required for  
21 effective implementation. Hydro aims to strike a balance by implementing risk management  
22 practices that provide meaningful value for decision-making around capital investments  
23 while considering the complexity and cost of implementation in the interest of ratepayers.

24 Hydro believes its current Capital Risk Evaluation Matrix is effective in meeting the intended  
25 objective; however, Hydro's capital risk evaluation practices are subject to continuous  
26 improvement, including improvements to be identified and implemented through Hydro's  
27 Asset Management Improvement Plan. Hydro may adopt different risk impact index values  
28 should it determine that there is meaningful value in doing so and that the cost of  
29 implementation is warranted.

30 **c)** While a lack of proportionality is likely a contributing factor, Hydro believes that the highly  
31 divergent costs associated with capital projects on assets with highly variable sizes and

1 complexity is the primary limitation of utilizing risk mitigation per \$1 million for  
2 prioritization of capital projects. Please refer to Hydro's response to PUB-NLH-004 of this  
3 proceeding for further discussion on the limitations of the prioritization of projects by risk  
4 mitigated per \$1 million.