Q. With respect to LIL unavailability:

a) To what extent is the prospect of LIL unavailability for up to six weeks during the coldest part of the winter a determinant in the Minimum Investment Plan? Has Hydro determined the probability of such a shortfall event? If the LIL were unavailable for up to two weeks, how would the Minimum Investment Plan be affected?

b) What types of events does Hydro plan for that might lead to the loss of a single pole on the LIL?

c) What types of events does Hydro plan for that might lead to the loss of both poles on the LIL

A. **a)** The expansion analysis completed for the Minimum Investment Required Expansion Plan was conducted based on Newfoundland and Labrador Hydro's ("Hydro") resource planning criteria[1] in consideration of ensuring the optimal balance between cost, reliability, and environmental responsibility, all of which are necessary.

- Probabilistic Capacity Criteria: The Island Interconnected System should have sufficient generating capacity to satisfy a LOLH[2] expectation target of not more than 2.8 hours per year.

- Firm Energy Criteria: The Island Interconnected System should have sufficient generating capability to supply all its firm energy requirements with firm system capability.

[1] For additional information on Hydro's resource planning criteria, please refer to the "2024 Resource Adequacy Plan – An Update to the Reliability and Resource Adequacy Study," Newfoundland and Labrador Hydro, rev. August 26, 2024 (originally filed July 9, 2024), app. B.
[2] Loss of Load Hours ("LOLH").

- Labrador-Island Link ("LIL") Shortfall Assessment: The Island Interconnected System should have sufficient generating capacity to limit the loss of load to a manageable level in the case of a LIL shortfall event.

The shortfall analysis conducted for the Minimum Investment Required Expansion Plan indicates that advancing a second capacity resource to 2031 is required to meet the LIL Shortfall Assessment Criterion. The selection of the threshold of 100 MW of shortfall[3] during average system conditions on the peak load day provides a balance between mitigating the reliability impact of a prolonged LIL outage and cost. A further reduction or elimination of the shortfall would require additional investment beyond that recommended in this analysis.

The loss of the LIL bipole would be considered a high-consequence event impacting the Island Interconnected System. While Hydro has not determined the probability of such an event occurring, it is prudent to plan for this potential scenario. Planning to mitigate the consequences of a prolonged LIL outage is essential and Hydro continues to evaluate reliability implications of an extended LIL outage as part of the resource planning process.

The extended outage scenario assumes the LIL is unavailable for six weeks during the coldest period of the year (i.e., January and February). Hydro used the output of the assessments completed by Haldar and Associates[4] in combination with the information provided in the Emergency Response and Restoration Plan as the basis for considering the potential length of a significant outage of the LIL.[5] The LIL extended outage is intended to simulate an icing situation that causes the collapse of 21 towers in a remote segment of the transmission line. This is an extreme scenario as there have been no incidents of an entire tower collapsing or nearing collapse to date; however, the extended outage scenario could generally apply to any prolonged outage event. If the outage were to last for a shorter duration, such as two weeks, or a longer duration than six weeks, the same amount of capacity is required to mitigate the shortfall to a manageable range. Therefore, there would

[3] Newfoundland Power Inc. was able to rotate 100 MW during 2014 loss of load event.
[4] For a synopsis of the recommendations by Haldar and Associates, please refer to "*Reliability and Resource Adequacy Study Review – Analysis of Recommendations, Mitigations, and Enhancements of the Labrador-Island Link,"* Newfoundland and Labrador Hydro, July 9, 2024.
[5] Please refer to "Reliability and Resource Adequacy Study – 2022 Update," Newfoundland and Labrador Hydro, October 3, 2022, vol. III, sec. 5.2.

be no change to the generation capacity identified in the recommended Minimum Investment Required Expansion Plan.

b) Events that can lead to the loss of a single pole include the loss of a converter transformer, weather-related events such as ice storms impacting only one pole, power system component failures, etc. In the event of a loss of a single pole, the healthy pole will automatically compensate to maintain the required power output. A single pole can operate continuously up to 675 MW.

c) Loss of bipole (or both individual poles at the same time), is considered a rare occurrence; however, it is prudent to plan for this potential scenario. The largest risk of a bipole event is when the system is operating in monopole and the in-service pole trips. The LIL was designed to minimize opportunities for bipole trips; however, weather and other high-impact events can result in the loss of an overhead line transmission tower, the loss of a station gantry that supports both poles and common neutral zone area faults that are detected by both poles can cause a loss of both poles. As stated in part a) of this response, Hydro has not determined the probability of a bipole event occurrence; however, considers it prudent to plan for this potential scenario.