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NEWFOUNDLAND POWER
A FORTIS COMPANY

June 13, 2023

Board of Commissioners
of Public Utilities
P.O. Box 21040
120 Torbay Road
St. John's, NL A1A 5B2

Attention: G. Cheryl Blundon
Director of Corporate Services
and Board Secretary

Dear Ms. Blundon:

Re: Newfoundland and Labrador Hydro – Reliability and Resource Adequacy Study Review – 2022 Update – Further Process – Newfoundland Power's Comments

A. Introductory

Newfoundland and Labrador Hydro's ("Hydro") *Reliability and Resource Adequacy Study – 2022 Update* (the "2022 Update") was filed with the Newfoundland and Labrador Board of Commissioners of Public Utilities (the "Board") on October 3, 2022. Hydro responded to Requests for Information from the parties on February 17, 2023. A technical conference was then held on May 1 and 2, 2023 to further discuss issues related to the 2022 Update.

By letter dated May 5, 2023 the Board directed Hydro to file a comprehensive list of reports, studies and analyses currently planned or underway with respect to the reliability of the Labrador-Island Link ("LIL"), potential alternative generation resources, the load forecast and other issues raised in the technical conference. In a letter dated May 25, 2023, Hydro provided a report detailing the reports, studies and analyses that are currently planned as part of its Reliability and Resource Adequacy Study (the "Report of Ongoing and Future Work").

The Board set today's date as the deadline for parties to file a list of issues or topics to be addressed with respect to the work being undertaken by Hydro. These are Newfoundland Power's comments regarding issues and topics it wishes to raise or see addressed in the work being undertaken by Hydro which should be included in the next update to the Reliability and Resource Adequacy Study.

B. Hydro's 2022 Update

Hydro's 2022 Update recommends extending the operation of the Holyrood Thermal Generating Station ("Holyrood") and the Hardwoods Gas Turbine ("Hardwoods") to ensure reliable operation of the Island Interconnected System in the event of a LIL outage. Hydro states that regardless of the assumptions made for Island Interconnected System load growth, LIL capacity, and bipole forced outage rate, the Island Interconnected System will be significantly

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capacity constrained once Holyrood and Hardwoods are retired. Hydro's recommendation is a departure from previous iterations of the Reliability and Resource Adequacy Study which anticipated the retirement of Holyrood and Hardwoods following integration of the Muskrat Falls Project into the provincial electricity system.[1]

Hydro's 2022 Update also proposes to add a new capacity asset that expands the existing Bay d'Espoir Hydroelectric Facility with the addition of Unit 8 to serve as a long-term backup facility and to support forecasted load growth.[2] Hydro indicates that the time required to recommend and commission Unit 8 could potentially take eight years.[3]

C. Hydro's Report of Ongoing and Future Work

Hydro's Report of Ongoing and Future Work included a list of planned reports, studies, and analyses (the "studies") currently underway or planned to support future Reliability and Resource Adequacy Study filings. The Report of Ongoing and Future Work details 17 separate studies including: (i) four separate investigations related to LIL equipment failure; and (ii) 13 studies related to supply options and support. It also includes a description of the scopes of work and responsible party for each study. The estimated filing date for the studies range from August 2023 to the fourth quarter of 2024.[4]

Hydro's Report of Ongoing and Future Work does not include Hydro's current schedule for future Reliability and Resource Adequacy Study updates or Hydro's proposed application for approval for new capacity additions. Hydro's updated schedule for those matters is expected to be filed with the Board on June 19, 2023.[5] Hydro's Report of Ongoing and Future Work also does not detail the anticipated contents the next update to its Reliability and Resource Adequacy Study.

D. Newfoundland Power's Comments

Newfoundland Power purchases approximately 93% of the energy required to supply its customers from Hydro. Wholesale supply costs from Hydro represent the single largest cost recovered from Newfoundland Power's customers. The reliability and cost of supply from Hydro directly affects Newfoundland Power customers.

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1 See 2022 Update, Volume III: Long-Term Resource Plan, Page 51, Lines 25-27.
2 See 2022 Update, Page 3, Lines 22-25.
3 See 2022 Update, Page 4, Lines 4-6.
4 See Hydro's Report of Ongoing and Future Work, Page 3, Table 1 – Planned Reports, Studies, and Analyses.
5 See the Board's letter dated May 5, 2023 Re: Newfoundland and Labrador Hydro – Reliability and Resource Adequacy Study Review – To Parties – Further Process, page 2.

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Newfoundland Power has been party to proceedings related to assessing the reliability of supply following the interconnection of the Muskrat Falls Project for almost a decade.[6] This included participation in Phase Two of the *Board's Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System* which commenced in 2014.[7] It also included participation in the Board's review of Hydro's Reliability and Resource Adequacy Study Long-term Resource Plan which was filed with the Board in 2018 and subsequently updated in 2019 and 2022.

Newfoundland Power has identified four issues for Hydro to address as part of the next update to its Reliability and Resource Adequacy Study and as part of its ongoing and future studies. These include: (i) applications for additional capacity; (ii) LIL as an energy only line; (iii) Hydro's probabilistic analyses; and (iv) near-term sources of capacity.

i) Applications for Additional Capacity

Prior to the 2022 Update, Hydro expected the Muskrat Falls Generating Facility in combination with the LIL to allow for the retirement of Holyrood and Hardwoods.[8] In the 2022 Update, Hydro established the need for backup generation in support of the LIL.[9] Since Hydro did not previously anticipate the need to backup the LIL, Hydro's only immediate options are to extend the retirements of Holyrood and Hardwoods until their capacities can be adequately replaced.[10]

Hydro does not consider Holyrood to be suitable for operation as a standby generating facility to be called upon in the event of an unplanned LIL outage, as it is anticipated that even under the fastest recall scenario analyzed, there is a high probability of issues during start-up, delaying synchronization of the units by several days. Hydro indicates that Holyrood will remain available as a baseload source of capacity until an adequate replacement can be put in service.[11] Operating Holyrood in this manner is estimated to cost approximately $150 million annually or approximately $1 billion between 2024 and 2030.[12]

Hydro's Report of Ongoing and Future Work identifies a Combustion Turbine Front End Engineering Design ("FEED") study which is likely to proceed following the results of Hydro's Combustion Turbine Feasibility Study.[13] Hydro states the Combustion Turbine FEED study is

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6 Newfoundland Power filed expert evidence as part of Phase Two of the Board's *Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System*. This includes: (i) the October 14, 2016 *Reliability Assessment of the Labrador Island Link* prepared by Elias Ghannoum; and (ii) the November 1, 2016 *Prefiled Evidence of Larry Brockman*.

7 In a letter dated October 8, 2014 the Board indicated that its *Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System* would be divided into two phases with the Board dealing with the immediate reliability issues for the Island Interconnection system prior to interconnection with Muskrat Falls in Phase One and reliability issues post-Muskrat Falls interconnection in Phase Two.

8 See 2022 Update, Volume III: Long-Term Resource Plan, Page 52, Lines 5-7.

9 See 2022 Update, Page 3, Lines 12-14.

10 See 2022 Update, Volume I: Study Methodology and Planning Criteria, Page 24, Lines 23-26.

11 See 2022 Update, Volume III: Long-Term Resource Plan, Page 24 Line 1 to Page 25 Line 18.

12 See 2022 Update, Volume III: Long-Term Resource Plan, Page 26, Tables 8 and 9.

13 See Hydro's Report of Ongoing and Future Work, Page 16, Lines 11-13.

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necessary to complete the engineering and planning required for the development of a cost estimate and other evidence to support a project sanction decision and a build application for a combustion turbine.[14] While Hydro's most recently commissioned combustion turbine was installed on an expedited basis over a period of less than 12 months, Hydro currently estimates that it would take a minimum of four years to place a combustion turbine in service.[15] Hydro also indicates that the combustion turbine FEED study will not be complete until Q4 2024.[16] Based on this timeline, an application for a new combustion turbine, if recommended by Hydro, will not proceed until Q4 2024 or sometime thereafter.

Hydro's 2022 Update indicates the need for additional capacity on the island interconnected system to: (i) provide backup to the LIL; and (ii) address future load growth. Hydro's 2022 Update includes the recommendation to proceed with an application to construct Bay d'Espoir Unit 8 to serve as a long-term backup facility and support forecast load growth. However, the 2022 Update is not clear on the replacement of Holyrood and Hardwoods capacity including: (i) what cost and reliability benefits an earlier replacement of Holyrood and Hardwoods would have for customers; (ii) what least cost options might be available to replace some or all Holyrood and Hardwoods capacity; (iii) a timeline for any new capacity additions; and (iv) consideration of how Hydro's recommendation to proceed with Bay d'Espoir Unit 8 influences the need to replace Holyrood and Hardwoods capacity.[17]

The above information is necessary to provide a full and comprehensive view of future supply requirements on the Island Interconnected System and should be included in Hydro's next update of its Reliability and Resource Adequacy Study.

ii) LIL as an Energy Only Line

Hydro's 2022 Update provides analysis of an extended outage to the LIL including treatment of the LIL as an energy-only line.[18] Hydro indicates that assessing LIL reliability in this way would result in significant incremental costs within the Island Interconnected System that must be balanced against the incremental reliability such investment would provide. Hydro does not recommend that treatment of the LIL as an energy only line be the defining reliability criteria at this time.[19]

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14 See Hydro's Report of Ongoing and Future Work, Section 2.2.12 Combustion Turbine FEED.

15 In April 2014, Hydro filed an application with the Board for approval of a 100 MW (Nominal) combustion turbine. The application followed large scale customer outages that occurred during the January 2-8, 2014 period known as #DarkNL. Hydro requested an expedited regulatory process for the Application. The Application was approved by the Board on May 7, 2014 and the combustion turbine was placed into service in March 2015. See Order No. P.U. 16 (2014) and the response to Request for Information PUB-NLH-300, Page 2, Lines 3-5.

16 See Hydro's Report of Ongoing and Future Work, Page 3, Table 1.

17 As an example, would an identified need for early replacement of Holyrood and Hardwoods provide the ability for Hydro to defer Bay d'Espoir Unit 8?

18 See 2022 Update, Volume I: Study Methodology and Planning Criteria, Page 17 Line 13 to Page 18 Line 17.

19 See 2022 Update, Volume III: Long-Term Resource Plan, Page 40, Lines 1-4.

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As part of its review, Hydro's consultant stated that excluding the LIL as the largest single contingency on the Newfoundland and Labrador System merits further review, especially considering the absence of any meaningful operational history for the LIL. The consultant further states that given a tower failure alone would result in a complete bipole outage, Hydro may be better served by treating the LIL as energy only and not as firm capacity. Hydro's consultant recognizes the potentially significant cost implications that need to be balanced with the reliability gained from such a shift in planning philosophy.[20]

In the 2022 Update, Hydro also states that it is committed to working with the Board and stakeholders to contemplate how an extended LIL outage scenario should be incorporated into Hydro's planning process, particularly in how best to balance cost and reliability.[21] Newfoundland Power agrees with the need to determine the appropriate balance between cost and reliability.

An assessment that compares the customer reliability outcomes (i.e. customer outages and consequences)[22], to the incremental cost of mitigating those outages will be informative for the Board and stakeholders. Hydro should include such an assessment in its next update to its Reliability and Resource Adequacy Study when considering the merits of the LIL as an energy only line.

iii) Hydro's Probabilistic Analyses

The underlying basis of Hydro's Reliability and Resource Adequacy Study is its probabilistic analysis to meet its reliability criteria.[23] While the 2022 Update considers overall system resource adequacy performance for a variety of scenarios in the coming years, it mainly presents the probabilistic results on an average annual basis that does not reflect the unique vulnerabilities inherent with the Island Interconnected System. Such analyses are recommended by the North American Electric Reliability Corporation ("NERC") and are commonly used to assess supply reliability and resource adequacy in highly interconnected and networked electrical systems with numerous geographically dispersed sources of capacity.[24]

The Newfoundland and Labrador electrical system is not highly interconnected to other neighboring jurisdictions. Rather, with the integration of the Muskrat Falls Project, the only transmission interconnections include the 900 MW LIL between Muskrat Falls and the Avalon

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20 See 2022 Update, Volume I: Study Methodology and Planning Criteria, Attachment 1, Page 6.

21 See 2022 Update, Volume III: Long-Term Resource Plan, Page 38, Lines 5-8.

22 For example, in the response to Request for Information NP-NLH-087, Hydro indicates that an extended outage could result in periods of rotating outages to approximately 40,000 to 50,000 customers at a time.

23 There are four generally accepted types of probabilistic metrics against which system reliability is measured, Loss of Load Probability ("LOLP"); Loss of Load Expectation ("LOLE"); Loss of Load Hours ("LOLH"), and Expected Unserved Energy ("EUE").

24 See for example, Hydro's *Reliability and Resource Adequacy Study - 2023 Update, Volume II: Near-Term Reliability Report – May Report* filed with the Board on June 2, 2023, Page 3, Lines 10-15. Hydro states that the analysis is consistent with the methodology proposed in the NERC "Probabilistic Assessment Technical Guideline Document".

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Peninsula and the 500 MW Maritime Link which has no firm capacity available to the Island Interconnected System and which is primarily used to export power to Nova Scotia and other electricity markets on the North American grid.

On the Island Interconnected System, a single failure of the LIL alone can cause Hydro to exceed its annual reliability criteria. Such an outage can occur during a single event and can cause significant customer outages over a short duration of time. A focus on an average annual reliability criteria, such as LOLP, may not accurately reflect customer reliability expectations on the Island Interconnected System since a LIL bipole outage could occur all at once during a relatively short period of time (i.e. weeks) and not throughout the year as Hydro's probabilistic criteria might imply. The resulting impact on customers could be a severe or extreme singular event as opposed to smaller relatively insignificant outages that could occur throughout the year in a more interconnected electricity system.

In the 2022 Update Hydro also states that the bipole forced outage rate remains the key driver on the planning reserve margin.[25] Hydro indicates that it will continue to revise its planning reserve margin as more operational data becomes available for the LIL. This means that if Hydro assumes the LIL will be more reliable, its probabilistic criteria will conclude that less generation reserves are required on the Island Interconnected System. Newfoundland Power questions whether adjustments to the LIL forced outage rate is an appropriate determinate of system reserves since a failure of the LIL is a single contingency event that could result in significant outages and severe consequences to customers.

Hydro's next update to its Reliability and Resource Adequacy Study should provide a detailed review of why its probabilistic criteria is appropriate for the Island Interconnected System given the unique vulnerabilities inherent in the size of the LIL, lack of transmission interconnections, and potentially significant customer consequences that could result from a LIL outage. Hydro's update should include an assessment of whether a deterministic criteria in establishing reserve margins is more appropriate where it requires a higher reserve margin than a probabilistic criteria alone.

iv) Near-Term Sources of Capacity

Hydro filed its most recent Near-Term Reliability Report (the "Near-Term Reliability Report") on June 2, 2023.[26] The Near-Term Reliability Report discusses near-term resource adequacy and reliability and provides the results of the probabilistic resource adequacy assessment of the Newfoundland and Labrador Interconnected System for the 2023-2027 study period.[27]

Newfoundland Power considers the reliability consequences resulting from an extended outage to the LIL combined with the high forced outage rates associated with Holyrood to be an

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25 See 2022 Update, Volume I: Study Methodology and Planning Criteria, Page 29, Lines 15-18.

26 Hydro filed its *Reliability and Resource Adequacy Study - 2023 Update, Volume II: Near-Term Reliability Report – May Report* with the Board on June 2, 2023.

27 See Near-Term Reliability Report, Page 3, Lines 10-12.

emergency situation for its customers that would likely require an extended period of rotating power outages such as those experienced during #DarkNL.[28] As the LIL has recently been commissioned, its reliability remains in question, as evidenced by the four LIL failure investigations detailed in the Report of Ongoing and Future Work.[29]

While Hydro's probabilistic analysis provides a view to near-term reliability, Newfoundland Power suggests that Hydro include additional information on what measures can be taken or what opportunities may be available to reduce customer outages that are likely to transpire following an extended LIL outage. Such measures or opportunities could include the probability that neighboring utilities may have *some* available capacity during a six-week LIL outage to provide capacity via the Maritime Link and whether any other sources of capacity, including mobile generation, can be made available on a temporary basis until new sources of capacity can be added to the Island Interconnected System.

Information on what measures or opportunities may be available to mitigate customer outages in the event of an extended outage to the LIL would enable the Board and other stakeholders to assess the extent of customer outages that may be experienced in the near-term and whether the costs of measures to mitigate such outages are justified and balanced with customer reliability requirements.

E. Concluding

Newfoundland Power's principle interest in the Board's review of Hydro's Reliability and Resource Adequacy Study is to ensure its customers have access to reliable and cost-effective sources of electricity supply both in the near-term and in the long-term. In its recent technical conference, Hydro highlighted that a clear and efficient process is required for a decision and approval of future capacity additions.[30] Newfoundland Power agrees that a clear and efficient process is required in order to determine the future supply requirements on the Island Interconnected System. Such a process will involve the information outlined in Hydro's Report of Ongoing and Future Work.

In Newfoundland Power's view, a clear and efficient process will also address Newfoundland Power's outstanding concerns. These include: (i) consideration of how Hydro's recommendation to proceed with Bay d'Espoir Unit 8 influences the need to replace Holyrood and Hardwoods capacity; (ii) whether the LIL should be treated as an energy only line in consideration of the need to balance costs and reliability; (iii) whether Hydro's probabilistic criteria is appropriate given the uniqueness of the Island Interconnected System; and (iv) what near-term opportunities exist to support the Island Interconnected System in order to respond to a potential supply shortfall, similar to what occurred during #DarkNL.

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28 For example, an extended outage to the LIL and a 34% forced outage rate of Holyrood, as considered in Hydro's Near-Term Reliability Report, implies that some degree of Holyrood capacity is unavailable for approximately one third of the time that the LIL is out of service.

29 See Hydro's Report of Ongoing and Future Work, Page 3, Table 1.

30 See Hydro's Report of Ongoing and Future Work, Page 2, Lines 7-8.

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Newfoundland Power is committed to working with Hydro, the Board, and other stakeholders to ensure customer reliability is adequately addressed on the Island Interconnected System. We trust this is in order. If you have any questions regarding the enclosed, please contact the undersigned.

Yours truly,

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