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January 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 – Requests for Information**

Please find enclosed Newfoundland Power's Requests for Information NP-NLH-065 to NP-NLH-094 in relation to the above noted Application.

If you have any questions regarding the enclosed, please contact the undersigned.

Yours truly,

A handwritten signature in blue ink, appearing to read "D. Foley".

Dominic Foley  
Legal Counsel

Enclosure

cc. Shirley Walsh  
Newfoundland and Labrador Hydro

Paul Coxworthy  
Stewart McKelvey

Dennis Browne, K.C.  
Office of the Consumer Advocate

Senwung Luk  
Olthuis Kleer Townshed LLP

**Newfoundland Power Inc.**

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**IN THE MATTER OF** the *Electrical Power Control Act, 1994*, SNL 1994, Chapter E-5.1 (the "*EPCA*") and the *Public Utilities Act*, RSNL 1990, Chapter P-47 (the "*Act*"), as amended, and regulations thereunder; and

**IN THE MATTER OF** Newfoundland and Labrador Hydro's Reliability and Resource Adequacy Study.

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**Requests for Information by  
Newfoundland Power Inc.**

**NP-NLH-065 to NP-NLH-094**

**January 13, 2023**

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## Requests for Information

NP-NLH-065

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 2, lines 8-10.

*"The reliability of the LIL is a crucial driver for the reliability of the Island Interconnected System. Since the 2018 Filing and 2019 Update, the LIL has had reliability challenges as a result of structural and software issues."*

Please provide a table summarizing all LIL component damage or failures (i.e. tower hardware, conductor, optical ground wire ("OPGW"), electrode lines, insulators, synchronous condenser, etc.) since January 1, 2020. In the table, please include:

- (i) description of component(s) affected;
- (ii) date identified;
- (iii) location;
- (iv) time required to access the location;
- (v) root cause;
- (vi) actions taken to make repairs;
- (vii) time required to make repairs;
- (viii) whether repairs were temporary or permanent;
- (ix) whether the damage caused an outage to the LIL;
- (x) whether the repairs required an outage to the LIL;
- (xi) duration of any outages;
- (xii) whether the outage was monopole or bipole.

NP-NLH-066

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 2, lines 8-10.

*"The reliability of the LIL is a crucial driver for the reliability of the Island Interconnected System. Since the 2018 Filing and 2019 Update, the LIL has had reliability challenges as a result of structural and software issues."*

Please provide a table summarizing all LIL outages due to software issues since January 1, 2022. In the table, please include:

- (i) description of the software issue;
- (ii) whether the outage was monopole or bipole;
- (iii) length of the outage; and
- (iv) actions taken to restore the LIL to service.

NP-NLH-067

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 3, lines 14-20.

*"Hydro is recommending continued investment in both the Holyrood TGS and the Hardwoods Gas Turbine to ensure reliable operation in support of the Island Interconnected System in the event of a LIL outage. This will be an interim solution for a "Bridging Period", during which Hydro will seek to develop long-term sources of supply. The units at Holyrood TGS and the Hardwoods Gas Turbine shall remain available until 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the LIL is proven, and generation reserves are met. During this period, Hydro will make every effort to minimize the operation of these units."*

Please describe what Hydro would consider to be "sufficient alternative generation"?

NP-NLH-068

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 3, lines 14-20.

*"Hydro is recommending continued investment in both the Holyrood TGS and the Hardwoods Gas Turbine to ensure reliable operation in support of the Island Interconnected System in the event of a LIL outage. This will be an interim solution for a "Bridging Period", during which Hydro will seek to develop long-term sources of supply. The units at Holyrood TGS and the Hardwoods Gas Turbine shall remain available until 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the LIL is proven, and generation reserves are met. During this period, Hydro will make every effort to minimize the operation of these units."*

Please describe what Hydro would consider to be "adequate performance of the LIL"?

NP-NLH-069

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 3, lines 14-20.

*"Hydro is recommending continued investment in both the Holyrood TGS and the Hardwoods Gas Turbine to ensure reliable operation in support of the Island Interconnected System in the event of a LIL outage. This will be an interim solution for a "Bridging Period", during which Hydro will seek to develop long-term sources of supply. The units at Holyrood TGS and the Hardwoods Gas Turbine shall remain available until 2030, or until such time that sufficient alternative generation is commissioned, adequate performance of the LIL is proven, and generation reserves are met. During this period, Hydro will make every effort to minimize the operation of these units."*

Has Hydro concluded that the LIL will always (i.e. beyond 2030) require either partial or full backup generation to address a bipole outage or are there possible scenarios, such as "adequate performance of the LIL", that may lead Hydro to conclude that no backup generation is required in the event of a bipole outage? If Hydro has concluded that the LIL will always require some amount of backup generation, what is Hydro's current estimate of the amount of backup generation required?

NP-NLH-070

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 4, lines 1-3.

*"The capacity and operational flexibility that Bay d'Espoir Unit 8 provides could be used to support intermittent renewable generation in the future, such as wind generation."*

Please provide a detailed explanation of how Bay d'Espoir Unit 8 could be used to support intermittent renewable generation in the future, such as wind generation.

NP-NLH-071

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 4, lines 4-10.

*"Recognizing that the time from recommendation to eventual commissioning of a new resource (such as Bay d'Espoir Unit 8) could potentially take eight years, the need to proceed with the integration of incremental generation is required. Hydro must also consider the current LIL reliability analysis and plan for the potential of an extended loss of the LIL. Hydro is therefore recommending to proceed with the development of an application for new supply, with the primary consideration being given to expansion at the Bay d'Espoir Hydroelectric Generating Facility; specifically, the addition of Unit 8, with a capacity of 154 MW."*

Please provide a timeline for the development of an application by Hydro for new supply, with the primary consideration being given to expansion at the Bay d'Espoir Hydroelectric Generating Facility; specifically, the addition of Unit 8.

NP-NLH-072

Reference: Reliability and Resource Adequacy Study – 2022 Update, October 3, 2022, page 4, lines 4-10.

*"Recognizing that the time from recommendation to eventual commissioning of a new resource (such as Bay d 'Espoir Unit 8) could potentially take eight years, the need to proceed with the integration of incremental generation is required. Hydro must also consider the current LIL reliability analysis and plan for the potential of an extended loss of the LIL. Hydro is therefore recommending to proceed with the development of an application for new supply, with the primary consideration being given to expansion at the Bay d 'Espoir Hydroelectric Generating Facility; specifically, the addition of Unit 8, with a capacity of 154 MW."*

Please compare the advantages and disadvantages of constructing new sources of supply on the Avalon Peninsula, near the load centre on the Island Interconnected System, to those associated with constructing new sources of supply off the Avalon Peninsula.

NP-NLH-073

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 5, lines 17-19.

*"Furthermore, the proposed Clean Electricity Standard has brought into question resource options that would traditionally have been recommended but are now uncertain as a future resource option (e.g., fossil fuel-burning combustion turbines)."*

Please provide the most recent documentation available from Environment and Climate Change Canada that details the proposed Clean Electricity Regulations (formerly known as the Clean Electricity Standard).

NP-NLH-074

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 5, lines 17-19.

*"Furthermore, the proposed Clean Electricity Standard has brought into question resource options that would traditionally have been recommended but are now uncertain as a future resource option (e.g., fossil fuel-burning combustion turbines)."*

Has Hydro reviewed how other Canadian jurisdictions are addressing the proposed Government of Canada Clean Electricity Regulations (formerly known as the Clean Electricity Standard) in their system planning activities, including the role of fossil fuel-burning combustion turbines? If so, please provide a summary and any relevant reports from those jurisdictions. If not, why not?

NP-NLH-075

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 5, lines 17-19.

*"Furthermore, the proposed Clean Electricity Standard has brought into question resource options that would traditionally have been recommended but are now uncertain as a future resource option (e.g., fossil fuel-burning combustion turbines)."*

Please provide the proportion of Hydro's annual energy production on the Island Interconnected System that would be from renewable sources versus the proportion that would be from non-renewable sources, during the 2023-2030 bridging period, for the following scenarios:

- (i) Continued use of Holyrood TGS as a backup facility.
- (ii) Replacement of Holyrood with an equivalent capacity of gas turbines.

NP-NLH-076

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 5, lines 17-19.

*"Furthermore, the proposed Clean Electricity Standard has brought into question resource options that would traditionally have been recommended but are now uncertain as a future resource option (e.g., fossil fuel-burning combustion turbines)."*

- a) What technologies, including combustion turbines, are currently capable of providing reliable and dispatchable backup generation to customers on the Island Interconnected System in the event of an extended (i.e. six weeks or longer) bipole outage to the LIL?
- b) Does Hydro anticipate that new technologies, capable of providing reliable and dispatchable backup generation, could be available and brought into service on the Island Interconnected System by the end of the 2023-2030 bridging period? If so, please elaborate.

NP-NLH-077

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 5, lines 17-19.

*"Furthermore, the proposed Clean Electricity Standard has brought into question resource options that would traditionally have been recommended but are now uncertain as a future resource option (e.g., fossil fuel-burning combustion turbines)."*

Has Hydro discussed the proposed Clean Electricity Regulations (formerly know as the Clean Electricity Standard) with Environment and Climate Change Canada including whether the proposed regulations would impede Hydro's ability to construct combustion turbines that may be necessary to ensure reliable service to customers on the Island Interconnected System? If so, please provide details of those discussions. If not, why not?

NP-NLH-078 Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 12, lines 9-11 and response to Request for Information NP-NLH-049, Attachment 1, Table 1.

*"To provide a fulsome view of the impacts of LIL reliability on the Island Interconnected System, an additional case analysis was completed that considers the bipole loss of the LIL as a single contingency (i.e. energy-only line)."*

Please describe whether Hydro's proposed reliability criteria for the planning and operation of the Island Interconnected System conforms to Northeast Power Coordinating Council ("NPCC") single event contingency requirements as it relates to the "simultaneous permanent loss of both poles of a direct current bipolar facility."

NP-NLH-079 Reference: Response to Request for Information NP-NLH-050

*"Newfoundland and Labrador Hydro ("Hydro") has not performed a review of its transmission system in accordance with TPL-001-4 and therefore does not have a listing of extreme events. Such a review would require a comprehensive network study that Hydro would perform if it were seeking full compliance with Northeast Power Coordinating Council ("NPCC") standards. Hydro is not seeking full compliance with NPCC standards at this time."*

Please explain the advantages and disadvantages of full compliance with NPCC standards, including whether full compliance would allow for greater access to generating capacity in neighbouring jurisdictions during emergencies such as a LIL bipole outage.

NP-NLH-080 Reference: Response to Request for Information NP-NLH-050

*"Newfoundland and Labrador Hydro ("Hydro") has not performed a review of its transmission system in accordance with TPL-001-4 and therefore does not have a listing of extreme events. Such a review would require a comprehensive network study that Hydro would perform if it were seeking full compliance with Northeast Power Coordinating Council ("NPCC") standards. Hydro is not seeking full compliance with NPCC standards at this time."*

Please describe Hydro's responsibilities in relation to the NPCC and whether those responsibilities can be expected to change in the future.

- NP-NLH-081 Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume I: Study Methodology and Planning Criteria*, October 3, 2022, page 20, lines 9-12.
- "Early discussions with various proponents interested in advancing new industries, such as hydrogen production, that would have a major impact on the system planning conclusions are not included in either Case I: Base or Case II: High Growth for the Island due to the unconfirmed nature of their needs."*
- Please provide a copy of Hydro's *Wind Integration Study* completed by Hatch on October 24, 2022.
- NP-NLH-082 Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 19, lines 2-5.
- "However, it is Hydro's view that the exact extreme combined wind and ice load scenarios suggested by Haldar & Associates are not supported by historical data at this time. In response, Hydro has invested in the installation of weather stations in these zones to monitor these conditions to inform if any structural investments are required."*
- a) Please provide the historical data referenced above.
  - b) Please provide the maximum wind and ice measurements that have been recorded in each LIL climatic zone.
  - c) Please provide any wind and ice measurements taken at the time and place of any LIL component damage or failures.
- NP-NLH-083 Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 19, lines 3-5.
- "In response, Hydro has invested in the installation of weather stations in these zones to monitor these conditions to inform if any structural investments are required."*
- Has Hydro determined that any structural investments on the LIL are required to either: (i) correct structural deficiencies or design issues that have become apparent since LIL was constructed; or (ii) address higher than anticipated loading due to wind and/or ice? If so, please describe.

NP-NLH-084

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 19, lines 5-9.

*Further, concepts relating to line length and regional correlation have not been widely validated or utilized within the utility industry. As such, Hydro does not have a basis to definitively accept such considerations; rather, Hydro will consider the impacts of a significant failure of the LIL, independent of the frequency of such an event occurring, as part of the extended LIL outage analysis discussed in Section 5.5.”*

Is Hydro engaging additional transmission line expertise to address its concerns regarding Halдар & Associates’ concepts relating to line length and regional correlation? If so, please provide details. If not, please explain how Hydro plans to either accept or reject Halдар & Associates’ considerations.

NP-NLH-085

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 26, Table 8, and Table 9.

Hydro indicates that approximately \$1 billion in capital, operating, and fuel costs (\$140 million, \$176 million, and \$697 million, respectively) will be required over the 2024-2030 period for the continued operation of the Holyrood TGS. Please explain if and when Hydro plans to recover these costs from customers.

NP-NLH-086

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 26, Table 8 and Table 9.

Please confirm that the load forecast used in the *Reliability and Resource Adequacy Study – 2022 Update* does not include the impact of higher customer rates and lower electricity consumption that would result from the estimated \$1 billion in additional costs necessary for the continued operation of the Holyrood TGS over the 2023-2030 period.

NP-NLH-087

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 33, lines 2-5.

*“Chart 10 includes both the Holyrood TGS and the Hardwoods Gas Turbine in service during the six-week LIL outage. In this scenario, it is estimated that customers can expect an average of 20 hours of unserved energy over a six-week period, with the highest anticipated shortfall estimated to be 150 MW.”*

- a) Please provide a table showing the annual reliability performance on the Island Interconnected System, in terms of unserved energy per customer, over the past 20 years in comparison to the scenario described above.
- b) Approximately how many customers does Hydro estimate would be impacted by outages in the scenario described above?
- c) Has Hydro investigated how an extended outage of the LIL, that could last six weeks or more, would impact customers on the Island Interconnected System, including whether businesses, schools, and other institutions would be able to maintain operations. If so, please provide details. If not, why not?

NP-NLH-088

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 33, lines 2-5.

*“Chart 10 includes both the Holyrood TGS and the Hardwoods Gas Turbine in service during the six-week LIL outage. In this scenario, it is estimated that customers can expect an average of 20 hours of unserved energy over a six-week period, with the highest anticipated shortfall estimated to be 150 MW.”*

Has Hydro examined how the risks and consequences associated with an extended LIL bipole outage compare to risks and consequences of transmission line outages in other Canadian jurisdictions? If so, how do the risks and consequences on the Island Interconnected System compare to those jurisdictions? If not, why not?

NP-NLH-089

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 33, lines 2-5.

*“Chart 10 includes both the Holyrood TGS and the Hardwoods Gas Turbine in service during the six-week LIL outage. In this scenario, it is estimated that customers can expect an average of 20 hours of unserved energy over a six-week period, with the highest anticipated shortfall estimated to be 150 MW.”*

For the six week scenario described above, please describe the extent to which capacity (MW) and energy (GWh) from the Holyrood TGS will be relied upon.

NP-NLH-090

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 33, lines 2-5.

*"Chart 10 includes both the Holyrood TGS and the Hardwoods Gas Turbine in service during the six-week LIL outage. In this scenario, it is estimated that customers can expect an average of 20 hours of unserved energy over a six-week period, with the highest anticipated shortfall estimated to be 150 MW."*

- a) For the six week scenario described above, please describe the extent to which capacity (MW) and energy (GWh) from the Holyrood Gas Turbine and Hardwoods Gas Turbine will be relied upon.
- b) Please estimate the volume of fuel required to supply the Holyrood Gas Turbine and Hardwoods Gas Turbine for the six week scenario described above. Furthermore, please comment on any factors, including storage and supply of fuel, that may limit Hydro's ability to operate these gas turbines.

NP-NLH-091

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long Term Resource Plan*, October 3, 2022, page 38, lines 17 to 22.

*"Based on the information provided herein and with the extended availability of generation from the Holyrood TGS and the Hardwoods Gas Turbine on the Avalon Peninsula, there is no appreciable reliability benefit of reinforcing of the AC transmission system at this time. As Hydro continues to work with stakeholders and advance long-term expansion plans, further analysis may be performed to assess if transmission system reinforcement is required to ensure that capacity from new sources of supply can be reliably delivered to customers in the event of a LIL bipole outage."*

How much additional generation could be added to the Island Interconnected System west of the Avalon Peninsula before reinforcing of the AC transmission system is required?

NP-NLH-092

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long Term Resource Plan*, October 3, 2022, page 40, lines 1-4.

*"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 has included this analysis as an additional case for information purposes; however, Hydro does not recommend this to be the defining reliability criteria at this time."*

Has Hydro finalized its reliability criteria for future resource planning on the Island Interconnected System? If not, what additional work and assessments does Hydro need to complete in order to finalize its reliability criteria?

NP-NLH-093

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long-Term Resource Plan*, October 3, 2022, page 48, lines 4-8.

*"To date, Hydro has not secured any capacity support from external markets for a duration longer than one month and does not have a basis to assume that such solutions would be available to meet long-term planning requirements. On this basis, market purchases were not included in the analysis. Hydro will continue to work with neighbouring utilities to explore the availability of firm supply solutions that could support reliability in the event of a LIL bipole outage."*

Please describe the transmission, capacity, and market constraints that hinder Hydro's ability to contract firm electricity imports from the Maritime Link to mitigate an extended outage to the LIL.

NP-NLH-094

Reference: Reliability and Resource Adequacy Study – 2022 Update, *Volume III: Long Term Resource Plan*, October 3, 2022, *Attachment 3, Independent Review of Hydro's Load Forecast 2022*, page 6.

*"Hydro should continue to make resource decisions that can be modified or can move aggressively to address need. The pending analysis of renewable energy options will likely provide additional insights relative to the ability of Hydro to plan for alternative futures effectively."*

What actions has Hydro taken in its 2022 Update to follow the recommendation above made by its consultant Daymark?

**RESPECTFULLY SUBMITTED** at St. John's, Newfoundland and Labrador, this 13<sup>th</sup> day of January, 2023.



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