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March 8, 2018

The Board of Commissioners of Public Utilities
Ms. G. Cheryl Blundon, Board Secretary
Prince Charles Building
210 - 120 Torbay Road,
St. John's, NL, A1A 2G8

Re: NLH Capital Application – Happy Valley-Goose Bay distribution upgrades – Labrador Interconnected Group RFIs

Pursuant to the Board's correspondence of August 10, 2018, please accept the enclosed the Requests for Information of the Labrador Interconnected Group, numbered LAB-NLH-01 through LAB-NLH-09.

Should you have any questions, please be sure to contact me.

Respectfully,
Olthuis, Kleer, Townshend LLP
PER:

SENWUNG LUK
PARTNER

SL/tw

IN THE MATTER OF the *Public Utilities Act*, RSN 1990, Chapter P-46 (the "Act"); and

IN THE MATTER OF an Application by Newfoundland and Labrador Hydro pursuant to Subsection 41(3) of the *Act*, for approval of capital expenditures to upgrade the Happy Valley-Goose Bay Distribution System

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Requests for Information

by the Labrador Interconnected Group

LAB-NLH-01 to LAB-NLH-09

August 24, 2018

Requests for Information

LAB-NLH-01 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page1 (Schedule 1, page 9 of 21)

Citation 1 (p. 1):

> The peak load at the HVY Terminal Station is modeled as 80.7 MW as per the Spring 2018 load forecast for the area.

a) Please indicate the number of MW included in the forecast of 80.7 MW which consist of companies engaged in cryptocurrency or other blockchain activities.

b) Please break down the previous response by individual service connection, indicating for each:

   a. The company name,

   b. The number of MW,

   c. The street address, and

   d. By which feeder it is served.

LAB-NLH-02 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page1 (Schedule 1, page 9 of 21)

Citation 1 (p. 1):

> The loading on the individual feeders assumes a coincidence factor of 92%.[2] (Note 2: Typically, each feeder on a distribution peaks at a different time creating a difference between the sum of individual feeder peaks and the total system peak. A coincidence factor is the ratio between these two numbers. The factor noted is a specific calculated coincidence factor for Happy Valley-Goose Bay.)

a) Please indicate the typical coincidence factor for a cryptocurrency/blockchain customer.

b) Does the specific calculated coincidence factor of 92% for HVGB take into account the presence of cryptocurrency/blockchain customers?

c) If not, please indicate what the specific coincidence factor for HVGB would be in the absence of cryptocurrency/blockchain customers.

d) Please describe and explain the effect, if any, on HVGB reliability planning and on the justification for the proposed project if the coincidence factor presented in response to the previous question were used, instead of 92%.

LAB-NLH-03 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, Table A1, page 3 (Schedule 1, page 10 of 21)

a) Please explain the meaning of the identifiers HV, HS, CR and NS.

Preamble:

> Table A1 refers to "CR5 (end)" (a portion of line HV8), and Figure 1 (page 2) also refers to "CR5 (end)". However, Table A3 on page 3 refers to "End of HV5".

b) Please confirm that "End of HV5" in Table A3 should instead read "End of CR5".

LAB-NLH-04 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page 3 (Schedule 1, page 11 of 21)

Citation:

> During events where certain supply sources are not available and when the system is operating near peak load, there will not be enough supply to meet the full town load. During such events it is important to establish feeder prioritization to ensure that power is being distributed in a way that will reduce the impact of the outage to the towns in the area. The feeders with the highest priority will be those with a large amount of community infrastructure such as grocery stores, schools, pharmacies, retirement homes, restaurants, and gas stations. The bulk of this infrastructure is located on the following feeders: …

Preamble:

> Table A1 on page 10 of 21 breaks down the HVGB peak load by Line and Portion of Line. Table A3 indicates the priority feeders, with a total of 25.1 MW.

a) Please provide a copy of Table A1, indicating for each portion of line whether it is in a priority zone, or not.

b) For each of the cryptocurrency/blockchain customers mentioned in your response to LAB-NLH-001 b), please indicate by which Portion of Line it is served.

c) Please provide a map of HVGB indicating with coloured shading the priority zones, the non-priority zones and the location of the cryptocurrency/blockchain customers mentioned in your response to LAB-NLH-001 b).

LAB-NLH-05 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page 4 (Schedule 1, page 12 of 21)

Citation:

> If the Happy Valley-Goose Bay Gas Turbine is unable to supply power during peak load [Situation 1] then the only source of supply will be L1301/L1302 with a capacity of 77 MW. This means there will be approximately 4 MW of load that cannot be served at peak.
>
> During this situation, it is recommended to tie the end of CR5 to HV10, and the end of HV16 to HV15 using two new gang-operated switches[4] and rotate HS4, HV7(industrial), CR5, CR6, HV15(industrial), and HV16 off for 30 minutes of each 90 minutes (each feeder will be on two thirds of the time). The amount of Cold Load Pick Up (CLPU) that can be tolerated under this situation is 35%.

a) Are there any circuits that would be disconnected (neither on nor rotated) under Situation 1? If so, please identify them.

b) Please estimate the number of hours per year when curtailment would be required, under Situation 1.

c) Please indicate how much load would be unserved at peak in Situation 1 if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed, and for how many hours (estimated).

d) Please indicate how the recommended feeder prioritization plan for Situation 1 would be modified, if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed.

LAB-NLH-06 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page 4 (Schedule 1, page 12 of 21)

Citation:

> If the Happy Valley-Goose Bay Gas Turbine is unable to generate power or provide synchronous condenser support during peak load [Situation 2] the only source of supply is L1301/L1302 at 65 MW. This means there will be 16 MW unable to be served at peak.
>
> During this situation, it is recommended to tie the end of CR5 to HV10, and the end of HV16 to HV15 using two new gang switches and rotate <u>CR4</u>, HV7(industrial), HV8, CR5, CR6, HV15(industrial), HV16 and HV17 off for 30 mins of each 60 min period (each feeder will be on one-half of the time). The amount of CLPU that can be tolerated under this situation will be 42%. [underlining added]

a) Please confirm that "CR4" should read "HS4".

b) Are there any circuits that would be disconnected (neither on nor rotated) under Situation 2? If so, please identify them.

c) Please estimate the number of hours per year when curtailment would be required, under Situation 2.

d) Please indicate how much load would be unserved at peak in Situation 2 if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed, and for how many hours (estimated).

e) Please indicate how the recommended feeder prioritization plan for Situation 2 would be modified, if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed.

LAB-NLH-07 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page 4 (Schedule 1, page 12 of 21)

Citation:

> If T31 fails and is removed from service [Situation 3] the capacity of L1301/L1302 becomes 37 MW. This, along with the Happy Valley-Goose Bay Gas Turbine will allow a total supply of 62 MW indicating a 19 MW deficit that cannot be served at peak.
>
> During this situation, it is recommended to tie the end of CR5 to L10, and the end of HV16 to HV15 using two new gang switches. Then rotate HS4, HV7(industrial), HV8, CR5, CR6, HV15(industrial), HV16 and HV17 off for 30 mins of each 60 min period (each feeder will be on one-half of the time). The amount of CLPU that can be tolerated under this situation will be 35%.

a) Are there any circuits that would be disconnected (neither on nor rotated) under Situation 3? If so, please identify them.

b) Please estimate the number of hours per year when curtailment would be required, under Situation 3.

c) Please indicate how much load would be unserved at peak in Situation 3 if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed, and for how many hours (estimated).

d) Please indicate how the recommended feeder prioritization plan for Situation 3 would be modified, if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed.

LAB-NLH-08 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study, page 4 (Schedule 1, page 12 of 21)

Citation:

> If L1301/L1302 fails [Situation 4] then the only supply for Happy Valley-Goose Bay will be the Happy Valley-Goose Bay Gas Turbine. It will have a capacity of 25 MW leaving a deficit of 56 MW that cannot be served at peak.
>
> During this situation, it is recommended to tie the north end of HV16 to HV15$_6$; tie the end of CR5 to HV10, and to energize feeders HV10 (with end of CR5), HV15 (with part of HV16) and HV1 with HS3. If loading allows it may also be possible to energize the core of North West River and Sheshatshiu on HV7.

a) Are there any circuits that would be disconnected (neither on nor rotated) under Situation 4? If so, please identify them.

b) Please estimate the number of hours per year when curtailment would be required, under Situation 4.

c) Please indicate how much load would be unserved at peak in Situation 4 if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed, and for how many hours (estimated).

d) Please indicate how the recommended feeder prioritization plan for Situation 4 would be modified, if all of the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a) were curtailed.

LAB-NLH-09 Re: Schedule 1, Appendix A: Minimizing Customer Impact upon Loss of Supply HVGB, Rural Planning Study

Citation:

> This project involves design, procurement, and installation of additional infrastructure on the Happy Valley-Goose Bay distribution system to minimize the impact of potential supply deficits that may occur if demand exceeds available generation and/or transmission capacity. The new infrastructure consists of a total of five (5) gang operated switches and the required poles and conductor for a line extension. Based on the recommendations from the *"Minimizing Customer Impact upon Loss of Supply – Rural Planning Study"* (Rural Planning Study), found in Appendix A, the upgrades include:
>
> > 1. Constructing a tie point between feeder HV10 and the end of feeder HV5. This will involve upgrading a section of distribution line from single phase to three phase, replacing poles along this section, as necessary, and installing two gang-operated switches; and,

2. Installing a gang-operated switch on each of the feeders HV7, HV15, and HV16 ;

a) Please indicate whether or not the proposed additional infrastructure would be required in order to curtail the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a).

b) If so, please indicate which element(s) of the proposed additional infrastructure would be required in order to be able to curtail the cryptocurrency/blockchain customers identified in the response to LAB-NLH-01a);

c) Please indicate which elements of the proposed infrastructure, if any, would be required if all cryptocurrency/blockchain customers could be curtailed as necessary to avoid disruption of service to other customers.