WHENEVER. WHEREVER.
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NEWFOUNDLAND POWER
A FORTIS COMPANY

August 20, 2021

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 – Requests for Information

Please find enclosed Newfoundland Power's Requests for Information NP-NLH-055 to NP-NLH-064 in relation to the above noted Application.

In accordance with the Board's February 12, 2021 notice regarding the activation of its Business Continuity Plan to address the COVID-19 pandemic, these Requests for Information are provided in electronic format only.

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

Yours truly,

Dominic Foley
Legal Counsel

Enclosure

ec. Shirley Walsh
Newfoundland and Labrador Hydro

Paul Coxworthy
Stewart McKelvey

Dennis Browne, Q.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.

Requests for Information by Newfoundland Power Inc.

NP-NLH-055 to NP-NLH-064

August 20, 2021

Requests for Information

NP-NLH-055

Reference: Reliability and Resource Adequacy Study, *Labrador-Island Link Reliability Assessment – Summary Report*, March 12, 2021, page 1.

"Based on the assessment of the as-built design of the LIL, the baseline measure of reliability for the LIL is:

- *1:72 year return period based on CSA 60826"*

Section A.1.2.5 – Selection of reliability levels in the CSA Standard CAN/CSA C22.3 No. 60826-10 describes three reliability levels for transmission lines (50, 150, and 500 year return periods). Does Hydro consider the reliability level of the Labrador Island Link (LIL) sufficient for its proposed role in the Island Interconnected System (IIS), assuming Holyrood Thermal Generating Station (HTGS) and Stephenville and Hardwoods Gas Turbines (SGT/HGT) are decommissioned as planned?

NP-NLH-056

Reference: *Assessment of Labrador Island Transmission Link (LIL) Reliability in Consideration of Climatological Loads,* Haldar & Associates Inc., March 10, 2021, page iv.

"This analysis should be done with and without the effects of combined loads (ice, wind) with due consideration on both upper and lower limit values specified in CSA 60826-10… Initial sensitivity analysis indicates that the POF for structure support system in Zone 3a for 85/40 combined wind and ice load is 0.0539 (a fifteen-fold increase compared to 60/40 case under a baseline value) and this will make the LIL POF significantly higher."

In light of Dr. Haldar's recommendations, please confirm if the combined wind and ice study scheduled to be completed by July 31, 2021 used a value of 0.85·VR as opposed to the 0.6·VR used by EFLA. If not, why not?

NP-NLH-057

Reference: *Failure Investigation Report – L3501/2 Tower and Conductor Damage, Icing Event January 2021 in Labrador*, Nalcor Energy, May 28, 2021, page 14.

"Zone 1 of L3501/2, the subject of this investigation, would be classified as an Average Loading Zone with a "50 year Reliability Level Return Period of Loads, with respect to Nalcor Energy operating experience and LCP specific modelling and test programs" as specified in "Basis of Design – LCP-PT-ED-0000-EN-RP-0001-01" and "Overhead Transmission – Meteorological Loading for the Labrador-Island Link ILK-PT-ED-6200-TL-DC-0001-01"

Please provide copies of the referenced documents LCP-PT-ED-000-EN-RP-0001-01 and ILK-PT-ED-6200-TL-DC-0001-01.

NP-NLH-058 Reference: *Failure Investigation Report – L3501/2 Tower and Conductor Damage, Icing Event January 2021 in Labrador*, Nalcor Energy, May 28, 2021, page 75.

"The current suspension clamp design does not use armor rods to protect the conductor at the attachment point. A larger clamp with armor rods could be considered. As mentioned in Section 7.2, the locking washer and general clamp design is not as robust as it could be. Loads seen during the storm were in excess of this slip strength but substitution to a different strong clamp could aid in the long term."

Does Hydro intend to revisit the current suspension clamp design to include armor rods and/or more robust lock washer and clamp assembly? If not, why not?

NP-NLH-059 Reference: *Failure Investigation Report – L3501/2 Tower and Conductor Damage, Icing Event January 2021 in Labrador*, Nalcor Energy, May 28, 2021, *Appendix C – Conductor Failures - LITL*, EFLA, April 14, 2021, EFLA, April 13, 2021, page 17/20

"A very low unbalanced load of 4 kg/m can cause the electrode insulator glass disk to rub against the electrode conductor and damage the strands. The loading required is well within the design loads of 10 kg/m. Nalcor must investigate the possibility of increasing the distance between the conductor clamp and the insulator closest to the conductor so that the string can accommodate greater longitudinal swing than 55 degrees and not damage the conductor."

a) Please confirm whether Hydro intends to accept this recommendation.

b) Does the unbalanced ice study scheduled to be completed on June 30, 2021 include analysis of conductor swing under unbalanced ice loads in order to avoid insulator contact with the conductor. If not, why not?

NP-NLH-060 Reference: Reliability and Resource Adequacy Study, *Technical Conference #3 Presentation*, June 2021, slide 58.

"During Repairs LIL remained available during much of the work

- *Outage during the day time with LIL operational at night.*
- *Some repairs delayed to enable LIL to remain online.*
- *Some commissioning activities occurred at night."*

Please provide a detailed overview and explanation of maintenance or repair work that can and cannot be completed on the Labrador Island Link ("LIL") while it is in service. For example, what repairs can be made to a broken pole conductor, electrode line, Optical Ground Wire ("OPGW"), cross-arm, tower, *et cetera*, while the LIL is in operation and supplying load?

NP-NLH-061 Reference: Reliability and Resource Adequacy Study, *Technical Conference #3 Presentation*, June 2021, slide 35.

- *"All electrode conductor damage occurred near suspension clamp at tower.*
- *Damage ranged from a few broken strands to complete electrode conductor failure.*
- *Failures seen during this specific event on electrode line would not have caused full line power outage."*

Please explain whether a complete electrode conductor failure, electrode crossarm failure, or OPGW failure could result in a fault on a pole conductor and lead to a short term or longer term loss of supply.

NP-NLH-062 Reference: Reliability and Resource Adequacy Study, *Technical Conference #3 Presentation*, June 2021, slide 95.

	MW			
LIL Mode of Operation	Muskrat Falls	Losses	NS Block	Hydro Delivery
Bipole	900	70	158	672
Monopole with Continuous Overload	675	120	105	450
Monopole Metallic Return	450	65	80	305

In the format provided below, and using experience gained during the 2021 winter failures, please provide: i) the expected steady-state LIL mode of operation for each scenario listed; ii) a range of duration of all work required for repair (including identification of the issue and access to the location) from the moment damage occurs; iii) the maximum safe power transfer allowable while repair activities are ongoing; and iv) the estimated maximum supply deficit should the scenario occur at the maximum forecasted peak used in the development of Figure 5 in the *Reliability and Resource Adequacy Study – 2019 Update,* November 15, 2019, Volume III: Long-Term Resource Plan, Section 7.2.6, assuming HTGS, SGT and HGT are decommissioned as planned. Please also assume that imports on the Maritime Link are unavailable.

Scenario	LIL Mode of Operation (steady state)	Repair duration (range)	LIL Mode of Operation (During repair)	Maximum Supply deficit at peak (MW)
Electrode cross arm failure				
Electrode conductor break				
Pole conductor break				
Double electrode conductor break				
Single pole conductor and single electrode conductor break				
Single tower failure				
Multiple tower failure				
Ice removal activities – helicopter with insulated rod				

NP-NLH-063 Reference: Reliability and Resource Adequacy Study, *Technical Conference #3 – Follow Up Items*, June 2021, page 2.

"The LIL was in a bipole forced outage for 270 consecutive hours from February 7 to February 18, 2021 due to damage resulting from a combination of the weather events in January and the turn buckle failures on the pole conductor assembly. However, if power transfer over the LIL was a necessity, the bipole forced outage could have been reduced by relocating resources working on the electrode line repairs to focus on the pole conductor repairs and reducing some of the inspection work on adjacent turn buckles in the area of the failures. It is estimated that one pole could have been returned to service in 174 hours."

With reference to the graph provided as Figure 5 in the *Reliability and Resource Adequacy Study – 2019 Update,* November 15, 2019, Volume III: Long-Term Resource Plan, Section 7.2.6, please explain whether the damage sustained on the LIL in Winter 2021 could have resulted in a supply shortfall, loss of customer load, and/or possible load rotation until one pole was returned to service. Assume system load and supply availability is the same as used in the aforementioned Figure 5.

NP-NLH-064 Reference: Reliability and Resource Adequacy Study, *Technical Conference #3 – Follow Up Items*, June 2021, page 2.

"The LIL was in a bipole forced outage for 270 consecutive hours from February 7 to February 18, 2021 due to damage resulting from a combination of the weather events in January and the turn buckle failures on the pole conductor assembly. However, if power transfer over the LIL was a necessity, the bipole forced outage could have been reduced by relocating resources working on the electrode line repairs to focus on the pole conductor repairs and reducing some of the inspection work on adjacent turn buckles in the area of the failures. It is estimated that one pole could have been returned to service in 174 hours."

With reference to the graph provided as Figure 5 in the *Reliability and Resource Adequacy Study – 2019 Update,* November 15, 2019, Volume III: Long-Term Resource Plan, Section 7.2.6, please explain whether the damage sustained on the LIL in Winter 2021 would have resulted in a supply shortfall, loss of customer load, and/or possible load rotation until one pole was returned to service. Assume system load was the actual recorded values during the Winter 2021 event and supply availability is the same as used in the aforementioned Figure 5.

RESPECTFULLY SUBMITTED at St. John's, Newfoundland and Labrador, this 20th day of August, 2021.

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