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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 (2018) – Labrador Interconnected Group RFIs**

Pursuant to the Board's correspondence of March 7, 2018, please accept the enclosed the Requests for Information of the Labrador Interconnected Group, numbered LAB-NLH-001 through LAB-NLH-033.

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

Respectfully,  
Olthuis, Kleer, Townshend LLP  
PER:

A handwritten signature in black ink, appearing to read 'Senwung Luk', written in a cursive style.

SENWUNG LUK  
PARTNER

SL/tw

IN THE MATTER OF the *Electrical Power Control Act, 1994*, SNL 1994, Chapter E-5.1 (the “EPCA”), Public *Utilities Act*, RSNL 1990, Chapter P-47 (the “Act”): and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro (“Hydro”) for an Order approving, pursuant to Section 41 of the *Act*, based on revised information submitted pursuant to Board Order PU 43 (2017).

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**Requests for Information by the Labrador Interconnected  
Group**

**LAB-NLH-001 to LAB-NLH-034**

**March 8, 2018**

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1 **LAB-NLH-001** Page 9 of the report entitled Eastern Labrador Transmission System –  
2 Planning Report (Revision 1 – January 25, 2018) states that “the 7.6 MW increase in the  
3 2017 forecast is a direct result of service applications for new data centers”.

- 4 a. Please confirm that the data centre load is coincident with the peak load for Happy  
5 Valley – Goose Bay, and describe the load patterns observed among these clients.  
6 b. Does Hydro have long-term commitments from these data centre customers? If so,  
7 please provide the commitment timelines.  
8 c. Has Hydro completed or reviewed any analyses with respect to price elasticity  
9 associated with these types of cryptocurrency data mining centres? Does Hydro  
10 expect these data centre customers to remain customers in the Happy Valley – Goose  
11 Bay area if electricity costs increase significantly or even moderately given the  
12 relative ease with which the data centres can be relocated?  
13 d. Please confirm whether the increase in load caused by the data centres is 7.6 MW or  
14 8.6 MW.  
15  
16

17 **LAB-NLH-002** Please provide the actual peak load attained in 2016, 2017, and to date in  
18 2018 for the Happy Valley – Goose Bay area. In the event that the actual peak load for 2017  
19 differs from the forecasted 79.9 MW please provide the reason(s) for the difference.  
20

21 **LAB-NLH-003** Hydro indicates that the cumulative present worth costs associated with  
22 transmission line L1301 (including its associated assets at Churchill Falls Terminal Station  
23 and Muskrat Falls Tap Station MFATS3) and the Happy Valley Gas Turbine are  
24 approximately \$8 million and \$21 million respectively over the study period if current  
25 operating and maintenance procedures remain unchanged.

- 26 a. Hydro states in its January 29, 2018 correspondence accompanying the revised  
27 project submission that “with respect to the operational and maintenance plan for the  
28 Happy Valley gas turbine, as part of the recommended option, the unit will have a  
29 much lower utilization as it will not be required to operate as a synchronous  
30 condenser for load transfer”. Please provide an estimate of the cost savings over the  
31 study period associated with this reduced gas turbine utilization as well any savings  
32 resulting from L1301 being open circuited at MFATS3.  
33  
34

35 **LAB-NLH-004** Please provide a cost estimate for Option 7 – Addition of Mobile Diesels  
36 such that sufficient mobile diesel generation is installed to accommodate peak loads in the  
37 coming winter of 77 to 82 MW, in one-MW increments, taking into account the number of  
38 hours in which loads would exceed 77 MW of 81.4 MW. The cost estimate should include  
39 the costs associated with fuel storage, fuel supply, staffing maintenance, interconnection  
40 costs and permitting.  
41

42 **LAB-NLH-005** Within the response to RFI IOC-NLH-033, as part of Hydro’s 2017 GRA,  
43 Hydro states that “Hydro is in the process of developing a network addition policy in  
44 preparation for meeting the requirements to provide open access transmission”.

- 45 a. Has Hydro developed a network addition policy? If so, please provide a copy.  
46 b. Will the network addition policy apply to the Labrador Interconnected System?

- 1 c. What is Hydro's best estimate at this time for when it will be ready to submit a  
2 network addition policy for the Board's review?  
3 d. Has Hydro considered the possibility of extending the network addition policy to  
4 distribution customers? What changes, if any, would be required to NL regulatory  
5 policy to make that possible?  
6  
7

8 **LAB-NLH-006** Please disclose the amount of load from data centre contracts in Labrador  
9 East that:

- 10 a. are in service  
11 b. Hydro has committed to serving but are not yet in service  
12 c. has been requested but Hydro has not yet committed to serving  
13 d. has been the object of inquiries without a formal request for service  
14  
15

16 **LAB-NLH-007** For each type of load from LAB-NLH-006, please disclose any  
17 information Hydro has about:

- 18 a. the nature of the load's activities (cryptocurrency mining, data storage, real-time  
19 internet services, etc)  
20 i. the maximum capacity requested or provided  
21 b. the date when the service was requested (if applicable)  
22 c. the duration of the service contract requested or entered into  
23 d. the nature and extent of any financial guarantees provided by the client to Hydro  
24 e. any information regarding load shape provided by the client  
25 f. for any cancelled request, the service capacity requested in the cancelled request  
26

27 **LAB-NLH-008** What is the load shape for Happy Valley-Goose Bay, prior to the existing  
28 data centre contracts? More specifically:

- 29 a. Please provide a load distribution curve for Labrador East for the most recent years  
30 available, showing the number of hours for which each level of capacity is required.  
31 b. Please indicate the number of hours for each of the last five years for which Labrador  
32 East loads exceeded:  
33 i. 70 MW,  
34 ii. 69 MW,  
35 iii. 68 MW,  
36 iv. 67 MW,  
37 v. 66 MW and  
38 vi. 65 MW.  
39 c. Please describe the typical duration of a peak event in Labrador East.  
40 d. Please provide in Excel format the hourly loads in Labrador East for the last three  
41 years for which data are available.  
42  
43

44 **LAB-NLH-009** Please provide any information Hydro has regarding the price point at  
45 which existing data centres would relocate their Labrador-based operations.  
46

1 **LAB-NLH-010** Please provide any information Hydro has regarding the likelihood that  
2 data centre companies that have inquired about obtaining service in Labrador would maintain  
3 their requests if:  
4

- 5 a. they were required to contribute to the cost of network additions required to serve  
6 them, or
- 7 b. They were required to accept contracts under which their service could be curtailed  
8 during peak hours.  
9

10 **LAB-NLH-011** Has Hydro raised with the customers and potential data centre customers  
11 the possibility that they might be required to take financial responsibility for a certain share  
12 of the network additions that providing service to them will require? If so, please describe in  
13 detail these exchanges. If not, why not?  
14

15 **LAB-NLH-012** Has Hydro raised with existing and potential data centre customers the  
16 possibility of load curtailment? Please disclose any information regarding how much load  
17 curtailment, and in what seasons, may be possible for data centre customers.  
18

19 **LAB-NLH-013** With respect to the additional Department of National Defence (“DND”)  
20 load currently anticipated in 2020, please indicate:

- 21 a. Whether or not a contract for this additional capacity has been signed with DND;
- 22 b. Whether or not Hydro has had exchanges with DND regarding its willingness to  
23 accept interruptibility or other curtailment options. If so, please provide details of  
24 these exchanges. If not, why not?
- 25 c. More specifically, whether or not Hydro has asked DND what compensation it would  
26 require for curtailment during the winter peak;
- 27 d. Whether or not Hydro has provided DND with any estimates of its future rates, from  
28 2020 onward, and, if so, if DND has indicated any price sensitivity with regard to its  
29 future power requirements, and
- 30 e. Whether or not Hydro has asked DND if it would go ahead with its planned load  
31 increase if it were required to take responsibility for a portion of the additional capital  
32 cost required to allow Hydro to provide such service.  
33  
34

35 **LAB-NLH-014** Please clarify to what extent loads greater than 77 MW at Happy Valley-  
36 Goose Bay are compatible with reliable electric service. More specifically, please describe  
37 the consequences of transient or short-term loads that exceed this level, in increments of 1  
38 MW, taking into account existing diesel generation, utility-scale energy storage, curtailment  
39 options and any other demand management resources available to Hydro.  
40

41 **LAB-NLH-015** Please provide estimates of the additional generation that would be  
42 required – both in MW and in MWh/year – to meet forecast loads for a) the 2018-2019  
43 winter, and b) the 2019-2020 winter, taking into account the specific load shapes of existing  
44 and planned data centre loads, as well as the existing clientele. Please indicate how many  
45 hours supplemental generation would be required per year under each forecast.  
46

47 **LAB-NLH-016** Under the interim OATT approved by the Board in P.U. 3(2018), how  
48 would the costs of the proposed Labrador capital additions affect NLSO’s revenue

1 requirement? Please explain in detail how these additional costs would flow through to the  
2 various categories of consumers and of other potential users of the transmission system.

3  
4 **LAB-NLH-017** Has Hydro received complaints from its data centre customers in Labrador  
5 East regarding the frequency or duration of interruptions of service? If yes, how many such  
6 complaints were received, and to what interruptions did they pertain?

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8 **LAB-NLH-018** Has Hydro carried out a least-cost planning exercise with respect to  
9 additional loads in Labrador? Please provide a detailed description of the analyses carried  
10 out by Hydro with respect to the potential for and cost implications of:

- 11 a. Interruptible or curtailment options for DND or other large power users;  
12 b. Demand response for residential or commercial customers, including:  
13 i. remote management of space or water heating loads; or  
14 ii. critical peak pricing options, which provide bill rebates to customers that  
15 reduce their demand in response to declared system reliability events;  
16 c. Energy storage options, taking into account the recent fall in costs of utility-scale  
17 energy storage systems. Please include the date on which Hydro most recently made a  
18 cost estimate for energy storage options.

19  
20 **LAB-NLH-019** Please explain the options available to Hydro for providing additional  
21 voltage support in Labrador East. For each one, please indicate the amount of additional load  
22 that it would make possible to serve, and the cost.

**LAB-NLH-020** Please provide the justification of the Muskrat Falls to Happy Valley  
Interconnection Project based on reliability, under:

- a. a scenario where there are no data centre customer loads;  
b. where 6 MW of the load from data centres can be curtailed.

**LAB-NLH-021** Please confirm that:

- a. the service requests that Hydro currently has for Labrador East exceed 32 MW  
including the 8.6 MW for which service contracts are in place.  
b. the service requests that Hydro currently has for Labrador East exceed the design  
capacity of the Muskrat Falls to Happy Valley Interconnection as applied for in the  
present proceeding.  
c. Hydro has received inquiries for 200 MW in Labrador East.  
d. If Hydro cannot confirm any of (a), (b) or (c), please explain why.

**LAB-NLH-022** Please perform a reliability analysis for the situation where, once the  
Muskrat Falls to Happy Valley Interconnection is approved and constructed, the load on the  
Labrador East system exceeds its design capacity.

**LAB-NLH-023** Does Hydro currently have:

- a. any policy by which it can refuse to serve an applicant for general service in the Labrador Interconnected System? If so, please disclose this policy.
- b. any policy by which it can recover the costs of capital additions to the transmission network from new customers who cause those costs? If so, please disclose this policy.
- c. any policy by which it can disconnect an existing customer? If so, please disclose this policy.

**LAB-NLH-024** Based on current rates and policies, please disclose:

- a. the total capital cost of the Muskrat Falls to Happy Valley Interconnection;
- b. the amount that data centre customers in Labrador East will have contributed to the capital cost of the Muskrat Falls to Happy Valley Interconnection over a two year period;
- c. the amount of capital cost that would remain to be paid by other customers if the data centre customers are no longer customers in two years;
- d. the rate impact on other customers (residential, general service, industrial) should the data centre customers no longer be customers in two years.

1 **LAB-NLH-025** Loads in Labrador West are relevant to the generation capacity of the  
2 Labrador Interconnected system, as well as to the amount that all Labrador Interconnected  
3 customers (both East and West) may be expected to bear for network upgrades. Please  
4 disclose the amount of load from data centre contracts in Labrador West that:

- 5 a. are in service
- 6 b. Hydro has committed to serving but are not yet in service
- 7 c. has been requested but Hydro has not yet committed to serving
- 8 d. has been the object of inquiries without a formal request for service

9  
10 **LAB-NLH-026** Regarding additional loads in Labrador West (including loads which  
11 Hydro has committed to serving but are not yet in service, loads which have been requested  
12 but Hydro has not yet committed to serving, and have been the object of inquiries without a  
13 formal request for service), please disclose Hydro's plans for system upgrades (including  
14 high-level cost estimates) to serve these loads, in increments of 25 MW. Please include non-  
15 data centre loads in this discussion.

16  
17 **LAB-NLH-027** Regarding additional loads in Labrador East, including non-data centre  
18 loads, please disclose Hydro's plans for system upgrades (including high-level cost  
19 estimates) for the next 200 MW of load, in increments of 25 MW.

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22 **LAB-NLH-028** In Hydro's view, would it need either a legislative change and/or  
23 authorization from the Board in order to:  
24

- 1 a. deny service to a potential general service customer, if doing so would create  
2 unacceptable consequences for system reliability with existing infrastructure?  
3 b. Require capital contributions from a general service customer if, in order to provide  
4 service to that customer, it would have to make capital improvements to its  
5 infrastructure that cannot be characterized as Specifically Assigned assets?  
6

7 **LAB-NLH-029** In Hydro's view, does the Board have jurisdiction to oblige Hydro to:

- 8 a. deny service to a potential general service customer, if doing so would create  
9 unacceptable consequences for system reliability with existing infrastructure?  
10 b. require capital contributions from a general service customer if, in order to provide  
11 service to that customer, it would have to make capital improvements to its  
12 infrastructure that cannot be characterized as Specifically Assigned assets?  
13 c. treat cryptocurrency miners or other types of data centres differently than other  
14 general service customers?  
15 d. require Hydro to require multi-year service contracts, financial guarantees or other  
16 mechanisms from cryptocurrency miners or other types of data centres, insofar as  
17 they create significant demands on system infrastructure?  
18 e. curtail service to particular customers or groups of customers, in order to avoid a  
19 voltage collapse or other severe system consequences?  
20

21 **LAB-NLH-030** Under the hypothesis that all existing and future service contracts for  
22 cryptocurrency miners would be cancelled, please describe all options available to Hydro to  
23 improve reliability in Labrador East, describing the cost and reliability implications of each.  
24

25 **LAB-NLH-031** Please describe the implications for Labrador East of the loss of a  
26 transformer at either end of the 138kV line to Churchill Falls.  
27

28 **LAB-NLH-032** Please describe the ways that these implications could be mitigated, and  
29 the cost and timeframe for each one.  
30

31 **LAB-NLH-033** Please describe what actions have been taken over the last ten years to  
32 improve transmission reliability to Labrador East.  
33

34 **LAB-NLH-034** Has any attempt been made to obtain backup equipment that could be used  
35 to mitigate the consequences of a transmission failure in Labrador East, or to reduce the time  
36 during which the line would be out of service in the event of such a failure? If not, why not?