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September 7, 2016

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Via Electronic Mail and Courier

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

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

Dear Ms. Blundon:

**Re: Supply Issues and Power Outages Investigation and Hearing - Phase Two - To
PUB - Requests for Information**

Please find enclosed the original and twelve (12) copies of the Requests for Information IC-
PUB-1 to IC-PUB-34 of the Island Industrial Customers in the above Application.

We trust you will find the enclosed to be in order.

Yours truly,

Stewart McKelvey

Paul L. Coxworthy

PLC/kmcd

Enclosure

- c. Tracey Pennell, Newfoundland and Labrador Hydro
- Thomas J. Johnson, Q.C., Consumer Advocate
- Gerard Hayes, Newfoundland Power
- Denis J. Fleming, Cox & Palmer
- Dean A. Porter, Poole, Althouse
- Roberta Frampton Benefiel, Grand Riverkeeping Labrador Inc.
- Danny Dumaresque
- Larry Bartlett, Teck Resources Limited

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

IN THE MATTER OF the Board’s Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System (Phase 2).

**ISLAND INDUSTRIAL CUSTOMERS GROUP
REQUESTS FOR INFORMATION
IC-PUB-001 to IC-PUB-034**

Issued: September 7, 2016

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

IN THE MATTER OF the Board’s Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected System (Phase 2).

**REQUESTS FOR INFORMATION OF
THE ISLAND INDUSTRIAL CUSTOMERS GROUP
IC-PUB-001 to IC-PUB-034**

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RFIs on Liberty August 19, 2016 Report:

Reliability Pre-Muskrat Falls

IC-PUB-001 On page 6 of the report Liberty notes that Hydro's loss of load hours (LOLH) measure of supply reliability of 2.8 is the equivalent of one failure in five years, and then states: "Most utilities in North America work to a standard of once every ten years." Please provide a list of utilities to support this statement, and identify also any other utilities that are known to work to a standard of one failure in only five years.

IC-PUB-002 On page 11, Liberty references "...new criteria [for reliability] more consistent with North American practice..." Please confirm a level of LOLH and/or EUE that would be consistent with North American practice, and confirm if this criteria would be equivalent to one failure every ten years.

IC-PUB-003 On page 10 of the report Liberty notes that the risk on the IIS at this time, and for the next 2-4 winters, is greater than previously thought and exceeds Hydro's reliability criterion (EUE not exceeding 300 MW.h, which Hydro equates to an LOLH of 2.8). Liberty then states: "This does not mean that such risks are automatically unacceptable. One must balance the risk against the cost of new capacity to make an informed decision." Liberty goes on to state that there are several reasons why they consider the risk pre-Muskrat Falls to be higher than calculated by Hydro. In light of Liberty's assessment of the risk, and based on Liberty's experience

1 and current information on the IIS, what added capacity and
2 cost would it appear reasonable for Hydro to consider at this
3 time for the pre-Muskrat Falls period based: (a) on Hydro's
4 existing reliability standard and load forecasts, (b) on new
5 criteria that would be consistent with North American
6 practice and Hydro's existing load forecasts, and (c) on new
7 criteria that would be consistent with North American
8 practice and a revised load forecast of peak demand (P90)
9 equal to that provided June 30, 2015 (as shown in Figure II.3
10 of the Liberty report)?

11 **IC- PUB-004** At page ES-2 of the report Liberty notes that full in-service of
12 Muskrat Falls has been delayed until the winter of 2020-21
13 versus the originally planned winter of 2017-18. Please
14 comment on whether the risk of inadequate supply on the IIS
15 pre-Muskrat Falls will be adequately addressed when first
16 power is provided by Muskrat Falls as planned now in winter
17 of 2019-20, or will this risk only be adequately addressed
18 when full in-service of Muskrat Falls occurs?

19 **IC- PUB-005** At page 10 of the report, Liberty notes that Holyrood
20 generation will now be required beyond 2020 until at least
21 2022, assuming that Hydro maintains its plan to overlap
22 Muskrat Falls and Holyrood for several years. In light of
23 Liberty's assessment of the risk, and based on Liberty's
24 experience and current information on the IIS, please
25 comment on whether it is still reasonable for Hydro to
26 maintain its plan to overlap Muskrat Falls and Holyrood for
27 several years? In Liberty's view, what options, if any, might
28 Hydro reasonably consider in this regard?

29 **IC- PUB-006** At page 10 of the report, Liberty notes that the Hardwoods
30 and Stephenville units continue to be unreliable despite new
31 investments and that the situation with these units will
32 worsen as they age further. In light of Liberty's assessment
33 of the risk, and based on Liberty's experience and current
34 information on the IIS, please comment on whether it is
35 reasonable for Hydro to do any further investments in the
36 Hardwoods and Stephenville units or to include these units
37 when assessing existing reliable supply capability on the
38 IIS?

39 **IC- PUB-007** Please comment on what role load curtailment arrangements
40 / agreements with existing major customers may play in
41 addressing supply and reliability issues pre- and post-
42 Muskrat Falls.

- 1 **IC– PUB-008** In the event that new CTs are required, please comment on
2 what is the reasonable time required to plan and install such
3 new units?
- 4 **IC–PUB-009** At page 12 of the report, Liberty notes that new pre-Muskrat
5 Falls supply for IIS would not necessarily take the form of
6 new investment in combustion turbines, and that power that
7 would likely solve the pre-Muskrat Falls supply issue can be
8 imported on both the Labrador Island Link (LIL) (110 MW
9 potential recall power from Labrador) and the Maritime Link
10 (ML) (300 MW potential from Nova Scotia) when these lines
11 are in service. Based on current information and assuming
12 technical feasibility and the above supply availability, please
13 comment on whether both the LIL and ML will likely be
14 needed to solve the pre-Muskrat Falls supply issue or would
15 either the LIL or ML alone likely be adequate?
- 16 **IC–PUB-010** In the event that the LIL and/or ML was used to solve the
17 pre-Muskrat Falls supply issue, please comment on what (if
18 any) new opportunities might this provide for Hydro to
19 establish effective mitigation to address extended outages of
20 the LIL post-Muskrat Falls?
- 21 **IC–PUB-011** At pages 101-102, Liberty notes that Hydro faces new
22 standards and requirements for NERC compliance, that the
23 ML is presently on schedule for energization in late 2017,
24 and that the reliability framework, NERC / NPCC
25 compliance, and the legislation required for it should be a
26 priority. Please comment on whether Hydro will be required
27 to meet NERC compliance standards prior to any reliance on
28 ML, whether this requirement will need to be met prior to ML
29 coming into service, and whether this requirement exists
30 independent of any requirements of the provincial
31 government.
- 32 **IC–PUB-012** At page 49 Liberty states its understanding that LIL HVdc
33 cables may be installed in the summer of 2016 but that the
34 LIL may not be fully operational until 2019. Please provide
35 the basis for Liberty’s understanding that LIL operation may
36 be delayed until 2019, given that Nalcor’s press release of
37 June 24, 2016 indicated updated in-service in 2018 for the
38 LIL and the Labrador Transmission Assets, and Liberty’s
39 understanding of the LIL role prior to Muskrat Falls
40 generation starting to come into service.
- 41

- 1 **IC-PUB-013** Based on Liberty's experience and available information, is it
2 reasonable to conclude that Hydro's experience to date,
3 including its experience with the current link of Churchill Falls
4 to Montagnais transmission, has not provided Hydro with
5 any experience in regard to NERC compliance. Please
6 outline the challenges that, in Liberty's view, Hydro faces in
7 addressing the need for NERC compliance prior to the ML
8 coming into service.
- 9 **IC-PUB-014** If the LIL and ML are not utilized to supply power to the IIS
10 pre-Muskrat Falls, what is Liberty's understanding of the
11 potential use and operation (if any) of the LIL and ML after
12 they are in-service pre-Muskrat Falls? What reliability and
13 feasibility issues (if any) would be expected for any option
14 that assumed "intermittent use" of either the LIL or ML "as
15 required" pre-Muskrat Falls?
- 16 **IC-PUB-015** Please comment on whether the ML, after in-service, will
17 provide any system benefits to the IIS prior to compliance
18 with NERC requirements and/or absent agreements with
19 other utilities to secure power supplies for import to the
20 Island? Does the answer differ pre-Muskrat Falls versus
21 post-Muskrat Falls generation coming into service?
- 22 **IC-PUB-016** Please comment on whether the LIL, after in-service, will
23 provide system benefits to the IIS if Muskrat Falls is not in-
24 service and recall power is not available through the LIL?
- 25 **Reliability Post-Muskrat Falls**
- 26 **IC-PUB-017** On page 76 of the report Liberty notes that the assumption
27 that the ML would instantly change from export of power
28 from the IIS to import of 300 MW of power to the IIS "is likely
29 to be unacceptable to the Nova Scotia power system."
30 Please elaborate on the basis for this conclusion, and the
31 extent to which the ML could be reliably used to support the
32 IIS in the event of an LIL outage.
- 33 **IC-PUB-018** Please outline any key differences in the bipole technology
34 to be adopted for the LIL versus the ML, and the implications
35 (if any) for IIS reliability post-Muskrat Falls.
- 36 **IC-PUB-019** Manitoba Hydro in a filing for its latest bipole project noted
37 that "Wide front windstorm, fire, or tornado damage at
38 Dorsey Station could cause an outage that shuts down the
39 HVdc system for up to three years because of the time
40 required to repair or replace equipment of such complexity"

1 [Page 2-2 of Chapter II of the Bipole III Project filing,
2 available on
3 [https://www.hydro.mb.ca/projects/bipoleIII/pdfs/eis/download/chap](https://www.hydro.mb.ca/projects/bipoleIII/pdfs/eis/download/chapter2_need_and_alternatives.pdf)
4 [ter2_need_and_alternatives.pdf](https://www.hydro.mb.ca/projects/bipoleIII/pdfs/eis/download/chapter2_need_and_alternatives.pdf)]. What is Liberty's opinion
5 regarding the time required to repair the converter stations
6 on LIL or ML in case of similar outages?

7 **IC-PUB-020**

8 At page 104, Liberty notes that the operating limit of the 900
9 MW capacity LIL for the benefit of the IIS is about 573 MW
10 (900 MW, less Nova Scotia load, less losses, less 120 MW
11 spinning reserve). Confirm (or provide correct numbers and
12 explanation) that this 573 MW assumes losses at 92.1 MW
13 (Table III.4, 807.9 MW injected to ac system at Soldiers
14 Pond when 900 MW supplied at Muskrat Falls) and 114.9
MW Nova Scotia load (residual).

15 **IC-PUB-021**

16 At page 36 Liberty states that the maximum import by the
17 LIL to the IIS is 830 MW delivered to Soldiers Pond, with 157
18 MW exported to the ML. Explain the conditions assumed for
19 this maximum import to the IIS and export to the ML, and the
20 basis for the difference from the Table III.4 estimate of 807.9
21 MW rated power delivered at Soldiers Pond and the lower
amounts otherwise estimated for maximum export to the ML.

22 **IC-PUB-022**

23 At page 33 Liberty describes a continuous monopolar rating
24 of LIL at 552 MW at Soldiers Pond, with a pro rata split of
25 this power of 104 MW for the Nova Scotia Block and 448
26 MW for the Island. Please explain the basis for the 552 MW
27 rating, and explain the difference from the 530.6 MW rating
28 in Figure III.4 for monopole operation at 50% overload that
29 can continue as long as required. Please also confirm what
30 portion (if any) of the Island share is required for spinning
reserve.

31 **IC-PUB-023**

32 At page 25 Liberty describes a reduced dc voltage operating
33 mode for LIL with estimated maximum power delivery
34 (during bipolar operation) at Soldiers Pond of 650 MW, and
35 with a pro rata split of this power with the ML that yields 527
36 MW for the Island - a supply amount that Hydro estimates to
37 provide sufficient Island generating capacity until the 2030s.
38 Please confirm what portion (if any) of this Island share is
required for spinning reserve.

39 **IC-PUB-024**

40 At page 51 Liberty states that, with the outage of one
41 electrode line conductor, the continuous current is limited to
42 a level "which is equivalent to 358 MW being transmitted
from Muskrat Falls during monopolar operation". Please

- 1 confirm that the 358 MW referenced here is power injected
2 to the ac system at Soldiers Pond, and explain how the
3 outage of one electrode line conductor affects the 530.6 MW
4 indicated (page 25, Liberty report) as being transmitted to
5 Soldiers Pond with continuous monopolar operation.
- 6 **IC-PUB-025** At page 76, Conclusion IV-9 states that Hydro estimates
7 Pole outages to occur 9.36 times per year. Please comment
8 on whether this conclusion is consistent with estimates at
9 pages 72-73 of the Liberty report that bipole outages should
10 be expected once every 3 years and single pole outages
11 should be expected approximately 7.3 times per year.
- 12 **IC-PUB-026** At page 74 Liberty notes, regarding bipolar or monopolar
13 outages, that the “general tendency is for a higher number of
14 failures in the first couple of years of operation, with the
15 number then settling down to a lower level for may year, until
16 aging causes the number of failures to increase again.” At
17 page 18, Liberty notes that a 50-year life has been specified
18 for the LIL HVdc cables. Based on Liberty’s information and
19 experience, what is the reasonable expected life, and when
20 is aging reasonably expected to begin to cause an increase
21 in failures, for each major component of the LIL and ML
22 systems, e.g., cables, overhead line, converter stations,
23 electrode line and ground conductor.
- 24 **IC-PUB-027** Assuming a general tendency for a higher number of LIL and
25 ML failures in the first couple of years of operation, please
26 comment on whether there is a reliability benefit for the IIS in
27 this instance in having the LIL and ML in operation at least 2
28 years prior to requirement of these facilities for full operation
29 of Muskrat Falls?
- 30 **IC-PUB-028** At page 71 Liberty notes that, with the ML out of service,
31 “Hydro intends to limit the power delivered to the IIS via the
32 LIL to 662 MW (the continuous import capacity of a single
33 LIL Pole).” Please explain Liberty’s understanding of the
34 basis for reference to 662 MW here for a single LIL Pole and
35 the estimate at page 25 of 530.6 MW for continuous
36 monopolar operation.
- 37 **IC-PUB-029** Liberty notes the interruptible load benefit of the ML to the
38 IIS in the event of a power supply problem with either
39 Muskrat Falls or the LIL (page 54, Liberty report). Can
40 Liberty comment on under what conditions and applications,
41 after Muskrat Falls generation is in service, the ML could

1 provide either spinning reserve or emergency power to the
2 IIS in the event of an IIS, LIL or MF event?

3 **IC– PUB-030** Please comment on the potential benefits to the IIS in
4 activating the frequency controller in the Maritime Link VCS
5 control system as discussed at pages 54-55 of the Liberty
6 report, and the extent to which such benefits are likely to
7 exceed related incremental costs.

8 **IC– PUB-031** On pages 85 and 103, Liberty notes that any reversing of the
9 flow on the ML may, under favourable circumstances, take
10 an hour during which NL would experience loss of load via
11 UFLS. Please explain the basis for this estimate and confirm
12 that, even if available within approximately one hour, this
13 capability would still have considerable value to the IIS and
14 positively contribute to tighter capacity criteria and reduced
15 UFLS use recommended on Page 86 and 87.

16 **IC– PUB-032** Recommendation V-2 is that Hydro should evaluate the
17 degree to which new capacity, via dependable ML supply
18 and/or new CTs, is required to ensure that customer outages
19 due to loss of the LIL bipole are limited to those caused by
20 UFLS and those circuits are promptly (within hours) restored.
21 In light of Liberty's assessment of the risk, and based on
22 Liberty's experience and current information on the IIS,
23 please provide a reasonable estimate today of the new
24 capacity needed (or the potential range of such new capacity
25 needed) to meet this recommendation during the period prior
26 to the 2030s?

27 **Near-term Transition**

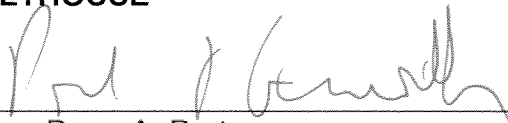
28 **IC– PUB-033** Conclusion VI-12 states: "Given that the Maritime Link will be
29 in service in about one year, there does not appear to be
30 suitable progress in resolving issues relating to market
31 transactions, such as responsibility, rate treatment, open
32 access, and avoidance of conflicts between marketing and
33 operations". Please comment on whether the issues that
34 need to be resolved prior to the ML coming into service also
35 include: (a) NERC / NPCC compliance, (b) Government
36 action and direction as required to complete the Provincial
37 reliability framework (to the extent that this is a prerequisite
38 for NERC compliance initiatives as well as open access
39 requirements), (c) conclusion of formal agreements with
40 Nova Scotia Power and New Brunswick Power to assure
41 that the proposed 300 MW backup supply for the IIS benefit
42 will be available in an emergency starting situation when the

1 ML comes into service, and (d) to the extent that adequate
 2 backup supply cannot be secured through formal
 3 agreements with Nova Scotia Power and New Brunswick
 4 Power, conclusion of plans to provide adequate new
 5 generation capacity on the IIS that Liberty has concluded will
 6 likely be needed pre- and post-Muskrat Falls coming fully
 7 into service.

8 **IC- PUB-034** At page 114 Liberty's recommendations VI-12 to 14 address
 9 NERC compliance, formulation of the Provincial reliability
 10 framework, and securing new generation backup capacity
 11 from either ML imports or other methods. Given that the ML
 12 will be in service in about one year, would Liberty support
 13 Hydro being required to prepare and provide a report to the
 14 Board, at least six months prior to energization of the ML,
 15 setting out an overall plan for addressing recommendations
 16 VI-12 to 14 as required by the time that the ML is energized?


DATED at St. John's, in the Province of Newfoundland and Labrador, this 7th day
 of September, 2016.

POOLE ALTHOUSE

Per: 

 Dean A. Porter

STEWART MCKELVEY

Per: 

 Paul L. Coxworthy

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