

December 10, 2018

The Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director Corporate Services & Board Secretary

Dear Ms. Blundon:

**Re: The Liberty Consulting Group Report – Analysis of Newfoundland Island
Interconnected System Power Supply Adequacy for the Winter of 2018-2019 –
Biweekly Update Report**

In its correspondence of September 19, 2018, the Board of Commissioners of Public Utilities (“Board”) requested that Newfoundland and Labrador Hydro (“Hydro”) provide a biweekly report on Hydro’s supply adequacy for winter 2018-2019, commencing October 1, 2018.

This biweekly report provides an update on the in-service of the Labrador-Island Link (“LIL”) and how it relates to winter 2018-2019 supply adequacy, as well as details on Hydro’s production facilities asset management.

The LIL In-Service Update

This report contains:

- an overview of the critical path tasks required for reliable operation of the LIL for winter 2018-2019;
- an overview of the highest risks being monitored and mitigated for the LIL in-service in winter 2018-2019;
- Hydro’s updated modelled assumptions for winter 2018-2019 supply adequacy planning; and
- Hydro’s proposed contingency plan to mitigate the consequences of unavailability or unreliability of the LIL for all or part of winter 2018-2019.

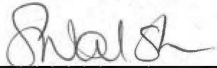
This report also contains meeting minutes from biweekly meetings held between Hydro, Transition to Operations (“TTO”), and Power Supply in which expectations of supply and energy

from the LIL in advance of winter 2018-2019 are discussed. Minutes from these meetings will be provided with each biweekly update report to the Board.

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



Shirley A. Walsh
Senior Legal Counsel – Regulatory
SW/kd

Enc.

cc: Gerard Hayes – Newfoundland Power
Paul Coxworthy – Stewart McKelvey
Denis J. Fleming – Cox & Palmer

ecc: Van Alexopoulos – Iron Ore Company
Senwung Luk – Olthuis Kleer Townshend LLP

Dennis Browne, Q.C. – Brown Fitzgerald Morgan & Avis
Dean Porter – Poole Althouse

Benoît Pepin – Rio Tinto

Labrador-Island Link In-Service Update

December 10, 2018

A Report to the Board of Commissioners of Public Utilities



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Attachment 1: Meeting Minutes

1 **1. Introduction**

2 Newfoundland and Labrador Hydro (“Hydro”) closely monitors its supply-related assets and
3 issues to ensure its ability to provide reliable service to customers. The availability of power
4 over the Labrador-Island Link (“LIL”) for the upcoming winter was identified in previous reports
5 to the Board by both Hydro and Liberty as contributing to supply adequacy in advance of
6 availability of the Muskrat Falls generation supply to the Island. Hydro is working closely with
7 Nalcor’s Power Supply leadership [Transition to Operations (“TTO”), Power Supply Transmission
8 Operations, and the Lower Churchill Project (“LCP”) Transmission Project] to monitor and
9 mitigate the risks associated with the timing of the in-service of the LIL to supply off-Island
10 capacity and energy to the Island Interconnected System. In each biweekly report, Hydro will
11 also provide an update on supply adequacy for the coming winter with the most up-to-date in-
12 service assumptions of the LIL, as required. The information in this report is current as of
13 December 5, 2018. Any developments after that date will be included in the next biweekly
14 report. Note that typical commissioning issues will be occurring as commissioning continues.
15 Updates regarding those issues known to materially affect the assumptions of capacity and
16 availability for the pending winter season will be provided as they become known. Otherwise,
17 any developments occurring after the preparation of the biweekly report will be included in the
18 next biweekly report.

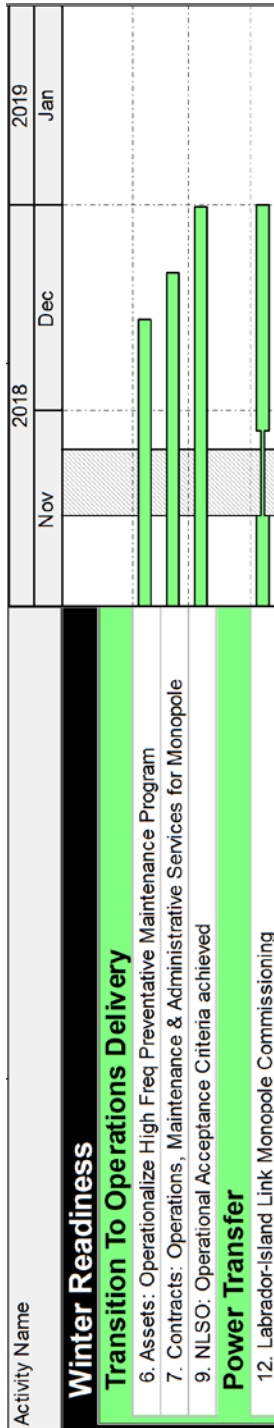
19

20 **2. In-Service Activities Update**

21 The following outlines the specific critical path activities required for operation of the LIL for
22 winter 2018-2019,¹ as well as schedule or constraint information for those tasks. As this report
23 is updated on a biweekly basis, Hydro will provide information on the key activities and the
24 associated schedule to inform the Board if any potential supply issues arise from the delivery of
25 those activities.

¹ This report discusses operational readiness for winter 2018-2019. The final in-service review of the LIL is undertaken separately with the Board’s consultant, Liberty, on a quarterly basis with TTO.

- 1 Attachment 1 contains minutes from the biweekly meeting held between Hydro and Power
- 2 Supply, which included discussions on expectations of supply and energy from the LIL for winter
- 3 2018-2019, and specific issues that may affect risks of supply over the LIL for the winter.



Please note:

- 1) The following activities are complete and no longer appear in Figure 1:
 - a. Item 1.a) Churchill Falls Terminal Station Breaker Upgrade (735kV scope)
 - b. Item 1.b) Churchill Falls Terminal Station Breaker Upgrade (315kV scope)
 - c. Item 2. Muskrat Falls Terminal Station 315kV GIS Voltage Transformer Replacement (1 unit)
 - d. Item 3.a) Churchill Falls Terminal Station 315kV GIS Voltage Transformer Replacement (1st campaign, 5 units)
 - e. Item 3.b) Churchill Falls Terminal Station 315kV GIS Voltage Transformer Replacement (2nd campaign, 2 units)
 - f. Item 4. ERP/ERR: Interim Emergency Response Plan/ERR in place for all Sites/Assets
 - g. Item 5. Contracts: Support services in place & resources onboard
 - h. Item 8. Inventory: Pre Winter 2018 readiness
 - i. Item 10.a & b) People: Implement 24x7 staffing model for Muskrat Falls
 - j. Item 11. Re-Energize Labrador-Island Link on 01-Nov-2018

Figure 1: The LIL In-Service Critical Path Activities

1 **Project Delivery**

2 **Activity 1 – Churchill Falls Breaker Upgrade**

3 **Status: Completed.**

- 4 • The 735 kV breaker failure protection upgrade has been successfully completed.
- 5
- 6 • The 315 kV breaker upgrades were successfully completed in the planned outage that
- 7 occurred from November 15 to 27, 2018.
- 8
- 9 • Additional background on the breaker failure upgrades: In the summer of 2017, prior to
- 10 the energization of the new 735 kV Churchill Falls Terminal Station (“CHFTS”) extension
- 11 breakers in the Churchill Falls switchyard, Hydro Quebec (“HQ”) reviewed the protection
- 12 design of CHFTS extension as well as the new Churchill Falls switchyard (“CHFTS2”).
- 13 Their review identified that there was vulnerability in the bus protection design as a
- 14 result of the “system A” and “system B” dc circuits coming together in one panel. The
- 15 concern is that both “A” and “B” dc protection circuits, that are meant to be fully
- 16 redundant, could be subject to a common failure within a single panel resulting in the
- 17 bus protection inability to satisfy HQ’s critical clearing time as dictated in their system
- 18 studies. This could result in a broader impact on the 735 kV system connecting the
- 19 Churchill Falls and HQ system as it responds to a slow clearing fault. The “system A” and
- 20 “system B” voltages were both in the bus protection “A” panel in the design as the bus
- 21 protection also incorporated the breaker failure protection.
- 22
- 23 • Changes were made in the fall of 2017 to the breaker failure protection for the new 735
- 24 kV breakers in the existing Churchill Falls switchyard to remove this vulnerability. Similar
- 25 changes were identified by HQ for the bus protection for the 735 kV breakers and the
- 26 315 kV breakers in the CHFTS2. There was insufficient time to design and implement the
- 27 changes for CHFTS2 prior to the 2017-2018 winter. This was mitigated by the

1 implementation of an operating restriction² to the CHFTS2 switchyard until the
2 modifications could be designed and implemented. The plan is to remove the operating
3 restriction in CHFTS2 for this coming winter by implementing the revised design that
4 removes both “A” and “B” dc protection circuits from the bus protection “A” panels.
5

6 **Activities 2 and 3 – 315 kV GIS Voltage Transformer³ Replacements**

7 ***Status: Completed.***

- 8 • The last of the seven voltage transformer (“VT”) replacements for Churchill Falls
9 (formerly Activity 3b in Figure 1) was successfully completed in the planned outage
10 window. All VT replacements requiring a system outage have now been completed.
11

12 **Transitions to Operations Delivery**

13 **Activity 4: Emergency Response Plan (ERP)/Emergency Restoration and Recovery (ERR):**

14 **Interim ERP/ERR in place as required at all sites/assets**

15 ***Status: Completed, no further updates.***
16

17 **Activity 5 – Contracts: Support Services in Place and Resources on Board**

18 ***Status: Completed, no further updates.***
19

20 **Activity 6 – Assets: Operationalize High Frequency Preventive Maintenance Program**

21 ***Status: On track for December 15, 2018 completion.***

- 22 • All requirements are in place for LTA/LIL assets with the exception of the converter
23 stations. The development of high frequency maintenance requirements for the
24 converters is ongoing.

² The operating restriction is the implementation of procedures that results in the operation of the Labrador Transmission Assets (“LTA”), two 735/315 kV transformers, and two 315 kV transmission lines as radial feeders out of the existing Churchill Falls switchyard. This operating restriction results in a less reliable operation of CHFTS2 because the failure of a single element in the station or one of the two 315 kV transmission lines will result in the removal from service of other elements in its radial line-up.

³ 315 kV instrument transformers.

1 **Activity 7 – Contracts: Operations, Maintenance, and Administrative Services for Monopole**

2 **Status: Expected completion of last two remaining items moved to December.**

- 3 • Two contracts remain outstanding. Bidders for the HVAC services contract requested an
4 extension to the tender close date from November 30, 2018 to December 14, 2018. The
5 extension was granted. The contract award is expected during the third week of
6 December. Procurement for the Cranes and Hoists services is in progress.

7
8 **Activity 8 – Inventory: Pre-Winter 2018 Readiness**

9 **Status: Completion of inventory with ongoing procurement.**

- 10 • Completed the winter readiness spares inventory requirement for the overhead
11 transmission lines and submarine cables.
- 12
- 13 • There is ongoing procurement of identified HVac station deficiencies. For HVdc assets,
14 all spares will remain in contractors care, custody and control until they are transferred
15 to Nalcor upon completion of bi-pole low power trial operation.

16
17 **Activity 9 – Newfoundland and Labrador System Operator (“NLSO”): Operational Acceptance**

18 **Criteria Received**

19 **Status: Completion of remaining items moved to December.**

- 20 • Three of the five NLSO requirements have been met. Final testing of redundant telecom
21 paths has been scheduled for the week of December 11, 2018. The operational
22 readiness document has been delivered in draft and is under review with the NLSO. The
23 final version of the document along with the release for service form is not yet
24 complete.

25
26 A description of the five NLSO requirements and status is as follows:

- 27 ○ Item 1: Ability to monitor the AC equipment associated with the converter stations
28 (including filter banks) remotely from the ECC for system reliability considerations.

29 **Status: Completed / Accepted.**

- 1 ○ Item 2: Asset owner contact details (to be responsive 24/7). **Status: Completed /**
2 **Accepted.**
- 3 ○ Item 3: Redundant communications paths (voice, tele-protection and SCADA)
4 between the ECC and all stations. **Status: In Progress.** The final configuration and
5 testing of the redundant communications paths is scheduled for the week of
6 December 11, 2018.
- 7 ○ Item 4: Provide a technical resource in the NLSO control room to support the
8 Energy Control Centre during the initial start-up period. **Status: Completed /**
9 **Accepted.**
- 10 ○ Item 5: Documentation including an Operational Readiness document (outlining
11 commissioning / testing activities, operating limits / restrictions, and identified
12 risks / plans for mitigation), and a completed/updated release for service form
13 outlining remaining deficiencies and expected timelines for completion. **Status: In**
14 **Progress.** As of December 5, 2018 the operational readiness document has been
15 delivered in draft and is under review with the NLSO. The final version of the
16 document along with the release for service form is not yet complete.

17

18 **Activity 10 – People: Implement Interim 24/7 Staffing Model for Muskrat Falls**

19 **Status: Completed.**

- 20 • An interim staffing rotation (between November 1, 2018 and December 31, 2018) for
21 Muskrat Falls is now in place to support the 24/7 requirement for reliable operations
22 during initial start-up/operations due to software control limitations.
- 23
- 24 • The recruitment of two additional resources to support the 24/7 rotation on a longer
25 term basis has been completed, with a start date of December 3, 2018. Both
26 components of activity 10 (10a and 10b) have now been completed.

1 **Power Transfer**

2 **Activity 11 – Re-Energize Labrador Island Link**

3 **Status: Completed as planned on November 1, 2018.**

- 4 • The Labrador Island Link was re-energized on November 1, 2018 at 45 MW using the
5 existing version (version 15) of GE software. Version 16a of GE software has also been
6 delivered (to site) and factory acceptance testing (“FAT”) of the next release is ongoing
7 in Stafford. Although version 16a of the GE software is available to install, a decision has
8 been made to remain on the current version (i.e., version 15). The decision was based
9 on the limited benefit of the additional features of Version 16a and the risk to the
10 schedule of implementing a new version which would have to undergo additional
11 testing.

12

13 **Activity 12 – Transmission Link Monopole Commissioning**

14 **Status: Initiated November 1, 2018.**

- 15 • The planned outage window that began on November 15, 2018 was extended from
16 November 24 to November 27, 2018. Analysis of the valve leak issue continued but was
17 not resolved during the outage window. A decision was made to monitor the system
18 under operating conditions to see if the valve leak issue could be replicated. The LIL was
19 re-energized on November 28, 2018 at 60 MW. It was not energized on November 29,
20 2018 due to the Maritime Link (“ML”) frequency controller being out of service⁴ and
21 severe weather being experienced in the Atlantic area. Monopole commissioning then
22 resumed on November 30, 2018 with daily testing at 60 MW for approximately 10 hours
23 per day, until December 3, 2018. The LIL was then taken out of service on December 4,
24 2018 to further investigate the valve leak issue and accommodate additional upgrades
25 (DS Agile update⁵). As of December 5, 2018, the valve leak had not been replicated;
26 however, a potential root cause associated with a vent valve has been identified and is
27 being investigated further. The link returned to service on December 7, 2018.

⁴ Nova Scotia Power had transmission issues on their system, after a wind/snow storm caused the ML to trip. During the process of restoring their system, the frequency controller was disabled.

⁵ An upgrade associated with communication between field devices and the ECC (not a GE software update).

- 1 • The current plan to achieve 110 MW involves several steps of ramping load up and
2 ramping back to monitor performance. The current schedule provides for the LIL to be
3 in continuous operation in mid-December. This schedule will adjust accordingly
4 depending on how each loading step performs.
5
- 6 • Punch list items are continually being addressed and closed by the project team. While
7 punch list resolution shall continue in an effort to improve system reliability, this effort
8 is not considered critical for power transfer.
9

10 **3. Key Risks**

11 There has been no change in the key risks since the October 1, 2018 report. In addition to the
12 activities described in Section 2, Hydro acknowledges that the reliability of the current GE
13 software implementation has yet to be demonstrated and remains a risk to the reliable in-
14 service of the LIL. The Power Supply LCP transmission project team has full-time representation
15 in Stafford, England where the upgraded software is being developed and tested and daily
16 status meetings are being held. Power Supply leadership also continues to work with GE
17 leadership in an effort to establish an agreed path forward for completing the upgraded
18 software for consideration for installation.
19

20 Dynamic commissioning with power transfer activities recommenced as scheduled on
21 November 1, 2018 with existing software. Testing continued on the upgraded version on the
22 system simulator in Stafford for future installation which is expected to occur after the winter
23 period.
24

25 An additional risk being monitored is the ML frequency response to the LIL initiated
26 disturbances when the LIL is in service. The frequency controller has remained in operation
27 using the settings that were investigated in operational studies. These settings help to avoid
28 underfrequency load shedding (and provide support to the Nova Scotia system).

1 To avoid frequent operation of the frequency controller, it has been equipped with a deadband
2 of +/- 0.5 Hz. As such, there will be a frequency controller activation if frequency drops below
3 59.5 Hz or goes above 60.5 Hz. When the LIL is switched on, the instant injection of 45 MW to
4 the island triggers overfrequency controller responses. Blocking (i.e. shutting off) the LIL results
5 in an underfrequency response. To reduce the number of responses, the current operating
6 philosophy is to disable the frequency converter just prior to LIL startups (for a period of
7 approximately five minutes) to minimize the overall number of frequency controller activations.
8 This is completed to satisfy Nova Scotia Power and New Brunswick Power Service Operators
9 over the number of activations. When the ML frequency response is turned off, the LIL
10 contribution to the Island's power supply is similar to a generator, and the reliability of the LIL
11 will be the major factor in the decision on loading level. The NLSO continues to work with Nova
12 Scotia Power and New Brunswick Power Service Operators to keep them informed of testing
13 plans so as to understand and mitigate the risk from their perspective.

14

15 **4. Modelled Assumptions**

16 There has been no change in the modelled assumptions since the October 1, 2018 report. The
17 following analysis, conducted in the same format as that provided in Hydro's previous response
18 and Near-Term Generation Adequacy Report, provides insight into the expected loss of load
19 and unserved energy for this assumption, as compared to the Conservative Supply Case from
20 Hydro's Near-Term Generation Adequacy Report. These results with the updated 30 percent
21 forced outage rate are presented in Table 1. Since the October 1, 2018 report, Hydro has load
22 tested the Holyrood's Unit 2 following its upgrades this maintenance season. Unit 2 was
23 successfully tested to its capacity of 175 MW.⁶

⁶ While under certain operating conditions the unit is capable of producing 175 MW (+5 MW as compared to its gross continuous unit rating), the 170 MW rating continues to be used from a planning perspective.

Table 1: Supply Adequacy Modelling Results for Updated Assumptions

EUE^{7,8}							
HRD ¹¹ DAFOR ¹²	Conservative Supply Case ¹³	Holyrood Full Capability ⁹			Holyrood Declining Capability ¹⁰		
		LIL = 110 MW	LIL = 55 MW	No LIL ¹⁴	LIL = 110 MW	LIL = 55 MW	No LIL
15%	37	97	139	242	142	204	364
18%	57	146	209	359	202	290	511
20%	74	185	265	453	250	359	626

LOLH¹⁵							
HRD DAFOR	Conservative Supply Case ¹³	Holyrood Full Capability ⁹			Holyrood Declining Capability ¹⁰		
		LIL = 110 MW	LIL = 55 MW	No LIL ¹⁴	LIL = 110 MW	LIL = 55 MW	No LIL
15%	0.69	1.64	2.36	3.95	2.55	3.66	6.33
18%	1.05	2.40	3.44	5.67	3.52	5.06	8.60
20%	1.34	3.01	4.30	7.04	4.28	6.15	10.35

1 5. Contingency Plan

2 In light of the new LIL winter 2018-2019 transfer assumptions, Hydro has developed a two-
 3 phased contingency plan for the coming winter that includes incremental internal and external
 4 system support. Phase I of Hydro’s contingency plan contains items that can be secured and
 5 incorporated into Hydro’s base planning assumptions for the upcoming winter operating season.
 6 Details and the status of items in Phase I of Hydro’s contingency plan are contained in Table 2.

⁷ Expected Unserved Energy (“EUE”).

⁸ The LIL FOR is 1% for the Conservative Supply Case only, all other cases include the LIL FOR of 30%. EUE criteria is 170 MWh and LOLH criteria is 2.8.

⁹ Holyrood Full Capacity: Unit 1 – 170 MW; Unit 2 – 170 MW; and Unit 3 150 MW.

¹⁰ Holyrood declining capacity starts at full capacity in December, declining through the operating season, consistent with behaviour observed during the winter 2017-2018 Operating Season. Holyrood Unit 2 was load tested on October 11, 2018, and achieved a capacity of 175 MW. No air flow issues were observed.

¹¹ Holyrood (“HRD”).

¹² Derated Adjusted Forced Outage Rate (“DAFOR”).

¹³ Conservative Supply Case results are consistent with those filed in Hydro's Near-Term Generation Adequacy Assessment, filed May 22, 2018.

¹⁴ The variance of results for the no-LIL case as compared to Hydro’s Conservative Supply Case with the LIL delay, as filed in the Near-Term Generation Adequacy Report, results from seasonal reporting in this instance versus annual reporting in the previous filing.

¹⁵ Loss of Load Hours (“LOLH”).

Table 2: Phase I of Hydro’s Contingency Plan

Item	Description	Incremental System Benefit	Parties Involved	Status	Notes
1	Increase of Capacity Assistance from 90 MW to 105 MW ¹⁶	+15 MW	Hydro, Corner Brook Pulp and Paper (“CBPP”)	Ongoing	CBPP has indicated that up to 105 MW is available. The proposed agreement was approved by the Board on November 22, 2018.
2	Re-instatement of Capacity Assistance Program	+7.6 MW	Hydro, Vale	Ongoing	Vale has indicated they are in agreement with Hydro’s proposed Capacity Assistance Agreements; one for their diesel generation (8 MW) and one for load curtailment (6 MW).
3	Re-instatement of Load Curtailment Program	+6 MW	Hydro, Vale	Ongoing	The proposed agreement was approved by the Board on November 30, 2018.
4	Voltage Reduction	+20 MW	Hydro, Newfoundland Power	Complete	Hydro has confirmed that it is reasonable to assume availability of 20 MW of Peak Voltage Reduction for the coming winter season. Voltage reduction is forecast on a week-ahead basis by the NLSO.
Potential Incremental System Benefit on peak		48.6 MW			

1 Hydro notes that voltage reduction is not what is publically known as "brown out". Voltage
 2 reduction is a measured and controlled process whereby there is minimal reduction in the
 3 delivery point voltages to customers. This process, utilized by utilities across North America as a
 4 typical system management tool, has been used for peak demand management in almost every
 5 year on the Island system. Customers see no impact to their service during a period of voltage
 6 reduction (typically up to four hours) and equipment is not harmed.

¹⁶ Hydro has now confirmed there is 105 MW available as compared to the 110 MW reported in the previous Biweekly Report. Given the relatively small change in magnitude of the available assistance, Hydro has not run the model for this 5 MW difference. Hydro presented the full analysis of its supply adequacy for winter 2018-2019 in its November 16, 2018 filing to the Board regarding supply adequacy.

- 1 In addition to the items listed in Phase I of Hydro’s contingency plan, Hydro has also identified
- 2 elements that can provide additional system benefit, but will only be enacted if absolutely
- 3 required. These items form Phase II of Hydro’s contingency plan and are detailed in Table 3.

Table 3: Phase II of Hydro’s Contingency Plan

Item	Description	Incremental System Benefit	Parties Involved	Status	Notes
5	Increased output of Holyrood Gas Turbine (“GT”) beyond current base assumption	+10 MW	Hydro	Complete	The ability to increase the capability of the unit is available on a temporary basis subject to atmospheric and system conditions. The GT has been previously safely demonstrated to operate to 134 MW.
6	Temporary increased output of Holyrood Diesels	+1.5 MW	Hydro, Department of Environment	Complete	Hydro met with the Department of Municipal Affairs and Environment and provided an overview of the potential upgrading requirements.
Potential Incremental System Benefit on peak		+11.5 MW			

- 4 Table 4 provides the overall impact of implementation of those Items in Table 2, in addition to
- 5 the items implemented as part of Phase I, as compared to the base case (provided in Table 1).

Table 4: Update of Winter 2018-2019 Supply Adequacy with Hydro’s Contingency Plan Implemented
EUE¹⁷

HRD DAFOR	Holyrood Full Capability ¹⁸			Holyrood Declining Capability ¹⁹		
	LIL = 110	LIL = 55	No LIL	LIL = 110	LIL = 55	No LIL
	MW	MW		MW	MW	
15%	33	68	121	46	97	176
18%	51	104	182	67	140	251
20%	66	133	232	85	175	311

LOLH

HRD DAFOR	Holyrood Full Capability ¹⁸			Holyrood Declining Capability ¹⁹		
	LIL = 110	LIL = 55	No LIL	LIL = 110	LIL = 55	No LIL
	MW	MW		MW	MW	
15%	0.60	1.21	2.09	0.88	1.80	3.19
18%	0.91	1.80	3.06	1.25	2.54	4.43
20%	1.15	2.27	3.84	1.55	3.12	5.40

1 As evident from the results, implementation of the aspects noted in Hydro’s contingency plan
 2 result in a material reduction of risk for the coming winter operating season. Hydro continues
 3 to conclude all six noted options and will provide updates on status of each as part of its
 4 biweekly updates to the Board.

5

6 **6. Conclusion**

7 Hydro is actively monitoring the availability of supply as it relates to the LIL and associated
 8 impact on reliability of the Island Interconnected System for this coming winter. Hydro’s
 9 existing and newly developed contingency plans described above are progressing in the event
 10 that the LIL does not meet the current assumed capacity and reliability parameters.

11

12 Hydro will keep the Board informed on developments related to the anticipated LIL in-service
 13 date and any material changes impacting supply adequacy for the Island Interconnected System
 14 in its biweekly report.

¹⁷ Includes the LIL FOR of 30%.

¹⁸ Holyrood Full Capacity: Unit 1 – 170 MW; Unit 2 – 170 MW; and Unit 3 150 MW.

¹⁹ Holyrood declining capacity starts at full capacity in December, declining through the operating season, consistent with behaviour observed during the Winter 2017-2018 Operating Season.

Attachment 1
Meeting Minutes

Meeting Minutes

Purpose	Discuss the LIL In-Service	Date	November 30, 2018
Chair	Jennifer Williams	Time	9:30-10:00 am
Location	Hydro Place	Minutes Taker	Josh DeCoste
Attendees	Jennifer Williams (Hydro), Josh DeCoste (Hydro), Jan-Peter DeSouza (TTO), Ron LeBlanc (Hydro), Rob Henderson (TTO), Walter Parsons (Power Supply), Perry Taylor (Power Supply)		

Schedule of key activities included in the biweekly report as well as minutes from previous meeting were reviewed and discussed for any changes. At the time of the meeting, there were no known material risks to schedule that would change in service assumptions.

For the October 5, 2018 Meeting and future, any changes to action items will be captured in action item register below, and any new items will have new actions/items added.

If new information arises post biweekly meeting, and in time for the report to the Board, it will be captured in the subsequent biweekly report to the Board and before the next biweekly joint meeting.

Action Plan			
No.	Action Item(s)	Owner	Target Date (DD-MMM-YYYY)
1.	21-Sep/24-Sep Meeting, item 1 S. Follett and S. Hurley (Project Execution) and P. DeSouza and R. Henderson (TTO) to draft key critical path activities required to reach reliable operation for winter for inclusion in Board reporting. Format to be confirmed.	S. Follett S. Hurley P. DeSouza R. Henderson	Complete
2.	21-Sep/24-Sep Meeting, item 2 Compile minimum required Newfoundland and Labrador System Operator ("NLSO") operational needs for inclusion in critical path activities.	J. DeCoste K. Goulding NLSO	Complete
3.	21-Sep/24-Sep Meeting, item 3 Discussion regarding software and associated reliable operation efforts. Currently commencing power transfer on 1-Nov-2018, with existing software, and continuing testing. If existing software is proven to be reliable through November 2018, Hydro and Power Supply will evaluate proceeding with software upgrade or maintaining existing software version. Upgraded software would be considered only after demonstrated reliable results from the system simulator work (RTDS). Power Supply leadership continues	Hydro Power Supply	Complete

Please note: If there are any comments or amendments to be made to these meeting minutes, they must be brought to the notice of the Meeting Chair within 24 hours of issue and confirmed in writing.

Meeting Minutes

Action Plan			
No.	Action Item(s)	Owner	Target Date (DD-MMM-YYYY)
	<p>to work with GE leadership for continued path forward and Power Supply still has full-time representation in Stafford</p> <p>2-Nov Meeting Update Stakeholders discussed the successful re-energization of the Labrador-Island Link (“LIL”) which had occurred as planned on 1-Nov-2018 at a power order of 45MW using the current release of GE software (version 15). The project team indicated that GE had also completed testing of the next iteration of the software (version 16A) and this had been received at site. In addition the project team indicated that the factory acceptance testing for version 1.0 was also in progress in Stafford, with current activities focused on regression testing.</p> <p>A discussion was held regarding release 16A and that it may be possible to implement the new version during the planned ten-day outage in Nov 2018. Continued review of the associated benefits, potential risks and available implementation timelines is ongoing and recommendations are to be developed if software should be upgraded over the next two to three weeks.</p> <p>16-Nov Meeting Update Recommendation by external HVDC consultant has been documented, findings include that there is a minimal benefit associated with version 16a, with no assurance that installation can be achieved in the ongoing planned outage without a negative impact. Based upon these findings it is not recommended to install the software in the current outage or take an additional outage to upgrade to 16a.</p>		
4.	<p>21-Sep/24-Sep Meeting, item 4 Power Supply and Hydro working together to operationalize TransGrid (“TGS”) studies on the LIL loading. These efforts will take modelled findings and test findings during commissioning for determining actual operational parameters for winter. Operational limits for the LIL from the TGS reports have been provided to the Project Delivery</p>	Power Supply and Hydro (combined group)	First meeting 25-Sep-2018 and continuing

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Meeting Minutes

Action Plan			
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	<p>team.</p> <p>2-Nov Meeting Update Stakeholders noted that the work with TGS was continuing.</p>		
5.	<p>21-Sep/24-Sep Meeting, item 5 Compile assessment of risks of changing to upgraded software package in advance of decision whether to implement new software or not as described above. Will be used in evaluation discussion.</p>	S. Hurley	Complete
6.	<p>21-Sep/24-Sep Meeting, item 6 Additional risk item for winter was noted. Hydro is currently planning to utilize the LIL at 110 MW and with frequency response in service. Should the LIL trip at a rate that causes frequent disturbances on neighbouring utilities, the request may be made by neighbouring utilities to take frequency response out of service. If that were to occur, Hydro would likely then decide to limit the LIL to 50 MW deliveries to avoid Under-Frequency Load Shedding (“UFLS”). No action required at this time.</p> <p>2-Nov Meeting Update No further discussion held on this decision.</p> <p>16-Nov Meeting Update NLSO has restricted LIL transfers to 45 MW, given recent requirements for the ML frequency controller, until the LIL can operate continuously for 48 hours without a trip. The frequency controller is now being deactivated temporarily prior to LIL start-ups, which previously caused it to react.</p> <p>30-Nov Meeting Update The NLSO lifted the 45 MW restriction to facilitate troubleshooting of the glycol leak.</p>	N/A	
7.	<p>21-Sep/24-Sep Meeting, item 7 NLSO will work with Nova Scotia Power Inc. System Operator (“NSPI SO”) and New Brunswick System Operator (“NBSO”) to keep them informed of testing plans so as to</p>	K. Goulding	Ongoing

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Meeting Minutes

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	<p>mitigate and understand the risk from their perspective.</p> <p>2-Nov Meeting Update No further discussion held.</p> <p>16-Nov Meeting Update NLSO has been in contact with NSPI SO and discussed the plan to impose restrictions on the LIL.</p> <p>30-Nov Meeting Update No further update (other than the restriction is lifted per above).</p>		
8.	<p>21-Sep/24-Sep Meeting, item 8</p> <p>No additional high-level risks other than software implementation and frequency response item were noted. Critical path activities compiled per Item 1 will be documented and considered for discussion at next meeting if required.</p> <p>12-Oct Meeting Update Group confirmed that there are no additional high-level risks other than software implementation and frequency response.</p> <p>2-Nov Meeting Update No further risks identified</p> <p>30-Nov Meeting Update No new risks discussed</p>	N/A	
9.	<p>21-Sep/24-Sep Meeting, item 9</p> <p>Current conservative supply assumptions of the LIL delivery for winter 110 MW at a 30% forced outage rate. Impact of this set of assumptions to be communicated to the Board in first biweekly report. No change in assumptions required based on this risk discussion.</p>	R. Smith	Ongoing

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	<p>19-Oct Meeting Update Group confirmed that there is no information at this time to indicate a change in modelled availability.</p> <p>2-Nov Meeting Update Group re-confirmed that the current expectation is to deliver 110 MW at forced outage rate of 30%.</p> <p>16-Nov Meeting Update No changes required to date, nor expected going forward.</p> <p>30-Nov Meeting Update No changes required to date, nor expected going forward.</p>		
10.	<p>21-Sep/24-Sep Meeting Undergo a risk assessment workshop with key stakeholders from Hydro, TTO, and Project Execution to evaluate software risks and subsequent required mitigation strategies.</p> <p>19-Oct Meeting Update Group discussed that to change to upgraded software would be a minimum of a two-week outage. Further discussion to be had at risk workshop being held on the afternoon of 19-Oct-2018.</p> <p>2-Nov Meeting Update Further discussion to be held prior to the Nov 2018 outage to evaluate viability of implementing version 16A of the GE software.</p> <p>16-Nov Meeting Update Risk assessment complete, and recommendation on timing of software upgrades has been made. Refer to action item 3.</p>	S. Hurley	Complete
11.	<p>19-Oct Meeting Update Group confirmed that issues regarding Astaldi have no impact on this winter's planned deliveries of the LIL.</p>	N/A	

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	<p>2-Nov Meeting Update No further discussion held.</p> <p>16-Nov Meeting Update No change.</p>		
12.	<p>16-Nov Meeting Update Group discussed ongoing planned outage to facilitate breaker fail upgrades and voltage transformer replacements. Completion of all planned work is tracking on target , scheduled to end on Nov 25. In the event that not all planned work can be completed within the timeframe, it is possible to delay until Q2/Q3 2019 with no risk to LIL operation during the coming winter, other than reduced flexibility due to being required to maintain the operating restrictions in CHFTS2.</p> <p>The glycol leak source location remains unknown. If the ongoing efforts to identify and repair the leak no not resolve the issue by re-energization on Nov 25, another outage may be required to complete repairs.</p> <p>30-Nov Meeting Update This meeting mostly centered around the first few days of start up of the LIL and plan for the coming days. In the first two days the link was online up to the date of the meeting, the glycol leak did not reappear. The team plans to continue loading the link and troubleshooting to find the leak. Of the other items that ere to be addressed during the outage, no items were de-scoped. The plan for the coming days is to finalize loading plan and continue troubleshooting the leak. The team aims for sustained 24 hour operation mid-December. Final plan pending in the next few days.</p>	B. Smith	Ongoing

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