

February 25, 2020

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 of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: The Liberty Consulting Group Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System – Monthly Update

On November 15, 2019, The Liberty Consulting Group (“Liberty”) filed its Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System (“Liberty Report”). On November 21, 2019, the Board of Commissioners of Public Utilities (“Board”) requested that Newfoundland and Labrador Hydro (“Hydro”) provide further information as a result of the findings in the Liberty Report. Hydro committed to providing Liberty and the Board with a monthly status update regarding the schedule for the Labrador-Island Link (“LIL”) software development and testing.

The information that follows continues to be set out in response to the specific requests detailed in the Board’s November 21, 2019 correspondence.

Labrador-Island Link Software Development and Testing Schedule (Board Request #2)

The Board requested the schedule for LIL software development and testing and that Hydro advise the Board on any future changes to this schedule, the reason for the change, and the implications of any delay for delivery of power and energy to the Island Interconnected System over the LIL.

In the January 14, 2020 update to the Board, Hydro noted that the Integrated Project Schedule (“IPS”) had not changed since the December 20, 2019 update. On January 31, 2020, Hydro informed the Board that Nalcor Energy (“Nalcor”) advised of slower than planned software development progress by GE Grid and, as a result, the “FAT¹ Complete; Interim Software to Site” milestone would not be met on February 2, 2020. Nalcor has updated its schedule to reflect this change in GE Grid’s progress, as shown in Table 1. Table 1 also includes the IPS as of December 20, 2019 for ease of reference.

¹ Factory Acceptance Testing (“FAT”).

Table 1: Integrated Project Schedule

GE Milestone

Interim Software – Limited Functionality (Low Power)		
	Schedule as of December 20, 2020	Schedule as of February 25, 2020
FAT Complete; Interim Software to Site	February 2, 2020	April 20, 2020
Dynamic Commissioning: Low Load Testing Complete	March 15, 2020	May 30, 2020
Dynamic Commissioning: Trial Operations at Low Load	March 16–June 12, 2020	May 31, 2020–July 29, 2020 ²
Final Software – Full Functionality (High Power)		
Final Software to Site	June 9, 2020	July 29, 2020
Dynamic Commissioning Complete at Available Power	July 15, 2020	August 31, 2020
High Power Testing	July 16, 2020	September 1, 2020

GE Grid completed all test cases for the Factory System Test (“FST”) phase of its software testing process in late January 2020; however, due to the number of failed test cases, the next testing stage (i.e., FAT), could not proceed. GE Grid has currently suspended the FST while it resolves critical software bugs in order to proceed to FAT.

The risk for further schedule slippage associated with the “FAT Complete; Interim Software to Site” milestone remains high, which has the potential to impact the Final Software delivery schedule.

Nalcor advises it is assessing all options to mitigate further schedule slippage for both the Interim (Low Power) and Final (High Power) versions of software to ensure needed levels of power and energy can be delivered to Hydro and Emera.

Synchronous Condenser Binding/Vibration (Board Request #4)

The Board referenced Liberty’s discussion of binding/vibration issues with the Soldiers Pond Synchronous Condensers (“SC”). The Board required Hydro to report on these two issues, including details of the problems and the investigation into their root causes, as well as a plan and schedule to address them.

High vibration was observed on SC Unit 3 and a binding issue was observed on SC Units 1 and 2 during the commissioning phase. As noted in Hydro’s December 13, 2019 correspondence, root cause investigations into both the vibration and binding issues were initiated by GE Power and external experts. GE Power is continuing its root cause investigation and conducting testing with respect to the synchronous condenser vibration and binding issues. Nalcor has provided Hydro with the following update regarding the vibration and binding issues and the schedule impact.

Vibration

The half-moon bearing housing support stiffener designed to mitigate the axial vibration was installed on SC Unit 3 in January 2020. GE Power has been running SC Unit 3 at various start-up and operating regimes to test vibration levels and has run the unit at maximum speed (900rpm) for several consecutive

² Trial operation is complete after 30 consecutive days of operations without a system trip.

days. Measurements collected during operation indicate that axial vibration has reduced as a result of the half-moon bearing housing support stiffener; detailed analysis is ongoing. GE Power is assessing options to resolve the lateral vibration associated with the foundation resonance. Conceptual designs are under review.

Binding

GE Power has removed the bearings and housings from both units for modification. The bearing housings have been modified to include a circumferential slot to reduce the apex point between the bearing and bearing housing. Re-installation of the modified bearing housing and bearing was completed on SC Unit 2 in February 2020 and manual rotation the unit was successful. Dynamic commissioning of SC Unit 2 is planned for March 2020 following commissioning of its auxiliaries, including the hydrogen system. SC Unit 1 re-assembly is planned to start in late February 2020. GE Power will install the re-designed single oil lift pocket bearing into SC Unit 1.

Schedule

In its January 31, 2020 correspondence, Hydro noted that the commissioning of all three units had been moved, with the last unit planned to be available for service in June 2020. Due to GE Power's ongoing root cause investigation, commissioning of all three units has moved to May-June-August for Units 3, 2, 1, respectively. Pending the outcome of the root cause investigations and the resolution, there is risk that the schedule may extend beyond August 2020. The SC are not currently on critical path and do not impact the LIL commissioning at low power.

Muskrat Falls Unit 1 Update

Andritz Hydro ("Andritz") is responsible for the turbines and generator contract. Under that contract the water passage through the unit was filled, and on January 28, 2020, Muskrat Falls Unit 1 achieved first rotation of the unit using hydraulic energy and the commencement of wet commissioning; this phase will include commissioning of both mechanical and electrical equipment. Through the commissioning process Andritz has identified minor issues during Unit 1 commissioning, which are being addressed by Andritz. Andritz has advised that replacement of the generator rotor rim keys will be required on the Muskrat Falls units, and has expedited fabrication of replacement keys. Unit 1 commissioning will be paused for approximately two weeks while the keys are being replaced. Under the most recent schedule of commissioning activities, Andritz plans to reach first power from Unit 1 in mid-March 2020 with commercial operation from Unit 1 anticipated in mid-April 2020. While their focus is on commissioning and start-up activities in preparation for first power from Unit 1, installation and testing work is continuing to advance on Units 2, 3, and 4. All four turbine and generator units are expected to be in commercial operation by the end of 2020.

Should you have any questions or comments about any of the enclosed, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



Geoffrey P. Young, Q.C.
Corporate Secretary & General Counsel
GPY/las

cc: **Newfoundland Power**
Mr. Gerard M. Hayes

Consumer Advocate
Mr. Dennis M. Browne, Q.C, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Mr. Paul L. Coxworthy, Stewart McKelvey

Praxair Canada Inc.
Ms. Sheryl E. Nisenbaum

ecc: **Board of Commissioners of Public Utilities**
Ms. Jacqui Glynn
Maureen P. Green, Q.C.
PUB Official Email

Newfoundland Power
Regulatory Email

Consumer Advocate
Mr. Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Ms. Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Ms. Bernice Bailey, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Mr. Denis J. Fleming, Cox & Palmer
Mr. Dean A. Porter, Poole Althouse

Teck Resources Limited
Mr. Shawn Kinsella