

September 28, 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 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 Consulting Group’s (“Liberty”) Eighth Quarterly Monitoring Report on the Integration of Power Supply Facilities to the Island Interconnected System. In its response, 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, updated information in response to the specific requests detailed in the Board’s November 21, 2019 correspondence, and other pertinent information with respect to the Muskrat Falls Project (“Project”). Nalcor Energy (“Nalcor”) has provided Hydro with the following information on various aspects of the Muskrat Falls Project.

COVID-19 Pandemic Effects on Muskrat Falls Project Execution

Nalcor and its contractors continue to follow all COVID-19 Health and Safety measures as per the established guidelines implemented for the project. Since May, significant emphasis has been placed on returning workers to site while strictly adhering to public health guidelines. The impact of lost time and a reduced workforce have meant impacts to the project cost and schedule.

Earlier today, Nalcor provided an update on the Muskrat Falls Project and COVID-19 pandemic impacts to cost and schedule.¹

In May 2020, it was anticipated the impact of COVID-19 would require an additional \$150–200 million in capital cost. However, the project now requires \$75 million in additional capital. The total COVID-19 cost impacts are roughly \$150 million; however, the project budget has been managed in a way that approximately half of the COVID-19 impact is covered under the existing capital budget.

Since 2017, the Muskrat Falls total capital budget has moved from \$10.1 billion to \$10.2 billion in September 2020.

¹ “Nalcor Achieves First Power Despite COVID-19,” Nalcor Energy, September 28, 2020, <<https://muskratfalls.nalcorenergy.com/newsroom/news-releases/>>.

As a result of the delay in completion of the project, there are payments due on the bonds issued to finance the project, as well as interest payments due of roughly \$360 million which would now need to be funded.

As outlined in May 2020, as a result of COVID-19 and some issues with software delays on the LIL, the project is experiencing a delay in final completion. The following chart details the updated key milestones for the Muskrat Falls Project. An update of the Integrated Project Schedule and any Authorization for Expenditure updates has been completed as of September 2020.

Table 1: Muskrat Falls Project Key Milestones Update

Scope of Work	Previous Forecast (Jan 2020)	Revised Forecast (Aug 2020) ²
First Power (Grid Synch)	15-Mar-2020	30-Sep-2020
Unit 1: Commercial Power	15-Apr-2020	31-Oct-2020
Unit 2: Commercial Power	20-Jun-2020	31-Dec-2020
Unit 3: Commercial Power	17-Sep-2020	31-May-2021
Unit 4: Commercial Power	18-Nov-2020	30-Sep-2021
Full Power	18-Nov-2020	30-Sep-2021
Converter Stations Bipole Dynamic Testing Complete	31-Aug-2020	30-Sep-2021
All Synchronous Condensers Ready for Operation	14-Aug-2020	31-Aug-2021 ³
Commissioning Certificate		TBD ⁴

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

The Board requested the schedule for LIL software development and testing and for Hydro to 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.

On August 13, 2020, during dynamic commissioning of LIL, a flashover incident in the Soldiers Pond Pole 2 valve hall resulted in damage to a fiberglass beam that triggered a trip of LIL. The beam is one of a set of beams that supports the valve assemblies of the HVdc converter. Subsequently, on August 22, 2020, a similar incident occurred in the Muskrat Falls Pole 1 valve hall resulting in damage to another beam that again triggered a trip of LIL. GE Grid has brought in valve experts from Europe to lead the investigation and testing at both sites. The focus of the investigation is on a residue that has been observed on some of the beams located inside the valve halls in both converter stations. The presence of this residue correlates with a measured decrease in beam resistivity to an unacceptable level and is believed to be the cause of the flashover. To assist with the Root Cause Analysis, GE Grid has shipped one beam to the manufacturer in Germany and the other beam, upon removal, will be shipped to their laboratory in New York for inspection and chemical analysis. While the origin of the residue is unknown at this time, GE Grid's preliminary Root Cause Analysis indicates that a potential manufacturing defect is the cause of

² While impacts from COVID-19 have been included in the updated costs and schedule, there are still other emerging risks being closely monitored including the outcome of any additional work that might be required on LIL valve hall equipment, remediation work on the synchronous condensers, the outcome of the Astaldi arbitration, and any additional impacts due to COVID-19.

³ Assumes foundation remediation solution.

⁴ Pending discussion with Nalcor, the Independent Engineer, the Government of Newfoundland and Labrador, and the Government of Canada

the residue and the affected beams will have to be replaced. It is currently anticipated that approximately 90% (approximately 350) of the beams installed will have to be replaced. A schedule and plan for this replacement is being developed.

GE Grid has presented Nalcor with an interim solution that will allow dynamic commissioning of LIL to recommence while the final remediation solution is determined. Replacement of the damaged beam at Muskrat Falls is complete. Replacement of the Soldiers Pond beam is in progress; once complete, GE Grid will prepare the valve halls for recommencement of dynamic commissioning, which is currently expected by early November 2020.

With respect to bipole software development, GE Grid is continuing their work on the Interim Bipole Software. The current Factory Acceptance Testing (“FAT”) schedule for Release B of the Interim software has a planned start date of September 30, 2020. After successful completion of FAT, Release B will be sent to site for installation and testing; however, resumption of dynamic commissioning activities is pending resolution of the valve hall incident. Once Release B is issued for dynamic commissioning, GE Grid will be fully focused on completing Final Bipole Software development.

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.

At the Soldiers Pond Synchronous Condenser Site, the Hydrogen detection system modifications on SC Unit 2 are complete. Dynamic commissioning of SC Unit 2 recommenced on September 28, 2020. Dynamic commissioning will involve running the unit at various loads up to 100% capacity to test the unit and to capture vibration data.

The SC Unit 3 elliptical bearings have been installed. All auxiliary systems have been reconnected internally. Manual rotation testing of the Unit is ongoing. The elliptical bearings may address the observed lateral vibration and eliminate the requirement for the foundation remediation work discussed below. Dynamic commissioning to determine whether this is the case is scheduled to start in early November 2020. If the elliptical bearings resolve the lateral vibration for SC Unit 3, then the bearings for the other units will undergo the same redesign. Installation of SC Unit 1 bearings and housings are pending the outcome of SC Unit 3 dynamic commissioning, as well as a decision on possible foundation remediation work.

With respect to the foundation remediation work intended to address the lateral vibration issue, the 60% design review is complete. Based on the current design phase progress, the earliest construction start date is early November 2020. GE Power and Nalcor are working on priorities and logistics for a construction schedule and mobilization. If the foundation remediation work is required, the priority will be to start construction on SC Unit 1.

Muskrat Falls Unit 1 Update

Andritz Hydro (“Andritz”) is responsible for the turbines and generator contract. Andritz is progressing its work scope under the contract in accordance with its 2020 work plan which was developed to respect COVID-19 conditions. Andritz has advanced commissioning of Unit 1, pre-commissioning of Unit 2, and assembly of Units 3 and 4.

Unit 1

On September 22, 2020, the first unit at Muskrat Falls was successfully synconized to the electricity grid in Labrador. Testing on the first generating unit will continue over the next few weeks prior to putting the unit in service which is anticipated in October. Through this testing period, the unit will be put on and off the electricity grid until it is ready for turn over to Operations.

Units 2, 3, and 4

Unit 2 commissioning activities are ongoing with preparation for mechanical runs and transformer/line commissioning identified as priorities. Cleanup of the oil release from the Unit 2 guide bearing has been completed. Completion of Unit 2 commissioning and Ready for Operation is forecast for December 2020.

Assembly of Unit 3 is ongoing. The Unit 3 rotor has been moved from the south service bay to the Unit 3 pit. Assembly of Unit 4 is ongoing.

The schedules for Unit 3 and 4 have been incorporated in the Integrated Project Schedule for September 2020.

Extension of Holyrood Thermal Generating Station as a Generating Facility

As previously committed to the Board,⁵ Hydro is providing an update on the proposed retirement date for the Holyrood Thermal Generating Station (“Holyrood TGS”).⁶ In light of the update to the Muskrat Falls Project schedule included above, Hydro is extending the readiness to operate the Holyrood TGS to March 31, 2023. This is an extension of one year of a previously committed ready to operate schedule.

Hydro has always intended to maintain up to a two-year period of standby operation of the Holyrood TGS during early operation of the Muskrat Falls Project Assets. The decision to extend until March 31, 2023 is being made at this time as there is a need to retain skilled staff at this facility and to allow for appropriate time to plan for completion of operating maintenance and required capital.

The Holyrood TGS is currently a critical part of the Island Interconnected System and is required to provide safe and reliable electricity. In exercising prudence and caution in its planning and preparedness, Hydro is proceeding with the extension. This decision has been made to ensure reliable service for customers while the Muskrat Falls Project Assets and the LIL are brought online and proven reliable.

⁵ Hydro previously communicated an extension to March 31, 2022 in correspondence “Extension of Holyrood Thermal Generation Station as a Generating Facility,” Newfoundland and Labrador Hydro, February 14, 2020.

⁶ “Reliability and Resource Adequacy Study Review – Near-Term Reliability Considering the Muskrat Falls Delay,” Newfoundland and Labrador Hydro, June 3, 2020.

If you have any questions, please contact the undersigned.

NEWFOUNDLAND AND LABRADOR HYDRO



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