

October 31, 2019

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: Reliability and Resource Adequacy Study – Liberty Recommendations – Further Information - Hydro's Comments

On November 16, 2018 Newfoundland and Labrador Hydro ("Hydro") filed the "Reliability and Resource Adequacy Study" ("Study") with the Board of Commissioners of Public Utilities ("Board"). The Board engaged The Liberty Consulting Group ("Liberty") to review the Study; Liberty's report was filed on August 20, 2019. On September 12, 2019, the Board requested Hydro to provide comments on seven recommendations noted by Liberty as requiring immediate action; Hydro's comments were filed on September 27, 2019.

On October 22, 2019, the Board requested that Hydro provide additional details on Liberty's Recommendations #1, #7, and #12 by October 31, 2019 with further information related to Recommendations #2 and #8 incorporated in the November 15, 2019 update to the Study. Hydro's responses regarding Recommendations #1, #7, and #12 follow.

Liberty Recommendation #1

"Hydro should promptly examine the likelihood and the range of consequences of an extended bipole LIL outage under extreme weather circumstances, and should undertake a robust examination of generation options (including continued use of the Holyrood steam units) to mitigate that risk."¹

Additional Information Requested

"With respect to Liberty Recommendation #1 (extended bipole LIL outage), an update with respect to the work being performed, including the name of the third party performing the engineering review and the schedule for the filing of the three planned reports."

Hydro's Response

As indicated in Hydro's September 27, 2019 correspondence, Nalcor Energy has continued to develop emergency response planning with respect to the overland portion of the Labrador-Island Link ("LIL") and is compiling a report ("Report 1") that summarizes the activities to date. This report will highlight both operational and engineering requirements with respect to proper emergency response planning for the LIL

¹ "Review of Newfoundland and Labrador Hydro's Reliability and Resource Adequacy Study," on August 20, 2019, The Liberty Consulting Group, August 19, 2019 at p. 21.

and various repair philosophies/solutions for consideration. Report 1 will also discuss the previous risk analysis and studies completed and identify priority-based recommended work scopes. Further, it will describe the progress to date for specific emergency response planning activities and highlight planned future activities. It is anticipated that there will be a report issued annually, highlighting any changes in plan and documenting any conducted exercises. The 2019 version of Report 1 is currently in draft, with a final report planned to be filed with the Board on November 29, 2019.

Hydro has engaged a third-party, EFLA Consulting Engineers (“EFLA”), to conduct the engineering review focused on the original design criteria and the structural capacity of the as-built design based on site-specific details and potential extreme weather conditions. Hydro has also engaged Halder & Associates, a third-party consultant with extensive knowledge of reliability and operating experience, which is intimately familiar with Hydro’s system. Halder & Associates has been engaged to review and provide feedback on the findings presented by EFLA. A final report (“Report 2”) describing the analysis undertaken and study findings will then be filed with the Board. The following schedule outlines the anticipated timelines for completion of the work for Report 2.

Activity	Party Responsible	Anticipated Completion Date
Computer-based modelling and detailed analysis	EFLA	November 15, 2019
Study findings and draft report issued for review	EFLA	December 6, 2019
Review of study findings and draft report	Halder & Associates	January 17, 2020
Revised analysis, based on Halder & Associates’ review	EFLA	January 31, 2020
Final report filed with Board	Hydro	February 28, 2020

Finally, to the extent that the findings of either Report 1 or Report 2 require additional modelling scenarios to be undertaken in Plexos, Hydro will begin such studies immediately upon receipt of the final reports from the parties engaged. The effort necessary to model results will be assessed at that time and Hydro will provide a schedule to the Board indicating when Hydro’s report containing the results of its analysis (“Report 3”) will be filed. Hydro estimates that such work could take up to three months to complete; however, the amount of time required to complete the modelling exercises will vary based on the complexity of implementing such scenarios in Hydro’s Plexos model and the computational requirements of the scenarios being considered. Hydro will provide Report 3 to the Board as an addendum to its 2019 update of the Study.

Liberty Recommendation #7

“Promptly conduct the analyses necessary to assess short-term and indefinite extension of Holyrood’s life as a supply resource.”²

Additional Information Requested with Respect to Recommendation #7

“With respect to Liberty Recommendation 7 (Holyrood Thermal Generating Station life extension), details with respect to the contingency plan for the short-term continued operation of the Holyrood Thermal Generating Station beyond April 2021 as well as the work and schedule associated with the long-term contingency plan for the indefinite operation of the Holyrood Thermal Generating Station.”

² “Review of Newfoundland and Labrador Hydro’s Reliability and Resource Adequacy Study”, on August 20, 2019, The Liberty Consulting Group, August 19, 2019 at p. 30.

Liberty Recommendation #12

"Engage an entity with substantial experience in boiler construction and repair to conduct a detailed assessment of the Holyrood's major systems."³

Additional Information Requested with Respect to Recommendation #12

"With respect to Liberty Recommendation #12 (Holyrood Thermal Generating Station major systems review), details of the nature and scope of the assessment which will be conducted, the identity of the third party, as well as a schedule for the completion of the work and firm date for the filing of any application for approval of capital expenditures."

Hydro's Response to Additional Information Requested for Recommendations #7 and #12

Based on the established schedule for power delivery from the Muskrat Falls project, the Holyrood Thermal Generating Station ("Holyrood TGS") is expected to have all three units available for operation at full capacity until March 31, 2021. Beyond that date, Unit 3 at Holyrood TGS will continue to operate as a synchronous condenser, while Units 1 and 2 are scheduled to be shut down and decommissioned.

The existing capital and operating and maintenance plans for the Holyrood TGS have been developed based on this schedule. The existing capital plan includes projects to facilitate steam generation from all units to March 31, 2021. The plan also includes projects for the conversion of Unit 3 to a dedicated synchronous condensing unit and projects required to support synchronous condensing operation into the future. The operating and maintenance plans, likewise, are constructed around the staffing and maintenance required to operate Holyrood TGS as a fully capable generating facility until March 31, 2021 and a single unit synchronous condensing facility beyond that date.

The current delays in the reliable supply of energy from the Muskrat Falls project makes it prudent to identify any changes to existing capital and operating and maintenance plans required to enable the Holyrood TGS to continue to be available to reliably supply customers while the project assets are being placed in-service and proven reliable. Details with respect to contingency plans to enable short-term continued operation of the Holyrood TGS beyond April 2021 (Phase One) as well as contingency plans to enable indefinite operation of the Holyrood TGS (Phase Two) follow. While investigation is ongoing and Hydro is not recommending implementation of these contingency plans at this time, the details are provided to further inform the discussion regarding the provision of reliable supply for customers. By the end of 2019, Hydro will be better informed to decide whether extended operation of Holyrood TGS is required by March 31, 2021. At that time, Hydro expects to have more clarity surrounding key milestones associated with the Muskrat Falls project. In January 2020 Hydro will provide the Board with its decision regarding a short-term extension (i.e. one to two years).

Phase One

In this phase, all three Holyrood TGS units will be able to operate reliably, whether online in generation mode or in hot-standby mode.⁴ This mode of operation is currently planned to April 2021 but could be extended to March 31, 2023 with additional investment. If this period were extended, it is expected that the overall energy produced by these units would be reduced considerably from recent years due to availability of energy over the LIL. Operationally, the Holyrood TGS units could be either online at minimum

³ "Review of Newfoundland and Labrador Hydro's Reliability and Resource Adequacy Study" on August 20, 2019, The Liberty Consulting Group, August 19, 2019, at p. 63.

⁴ In Phase One, hot standby mode requires units to be able to be recalled from standby to provide generation to the grid within four to eight hours.

output or in hot-standby as a backup for the loss of the LIL bipole, depending on the reliability of assets and system requirements.

Phase Two

This phase entails stand-by operation of Holyrood TGS from April 2023 through to an indefinite period:

- Holyrood TGS Units 1 and 2 would remain offline but capable of generating 170 MW each; Unit 3 will be operating as synchronous condenser but will remain capable of being converted to generate mode at 150 MW;
- Target recall times for Units 1 and 2 of 24 and 48 hours will be considered; and
- Assessment of the feasibility to reduce the time required to convert Unit 3 from synchronous condenser to generate mode.

Hydro is finalizing the details of the requirements necessary to support Phase One as described above and will include additional detail in its November 15, 2019 update to the Study. The additional detail will include information on required capital execution, supplemental capital plans, and operation and maintenance (“O&M”) activities including projected budgets and environmental considerations. It will also include information on activities associated with a planned major system review and life extension requirements study. Capital work will be categorized using three general classifications of projects:

- Sustaining capital work that is not dependent on end of steam operation;⁵
- Deferred capital work required to repurpose Holyrood TGS from a three-unit generating facility to a single-unit synchronous condensing plant;⁶ and
- Identified supplemental capital work required for safe and reliable operation of the steam generating equipment for an additional two years to March 31, 2023.

With respect to Phase Two, Hydro is in the process of developing an application for supplemental capital expenditures to engage an entity with extensive boiler experience to conduct a major systems review and life extension requirements study for the Holyrood TGS. The third party has not yet been identified as Hydro plans to issue a Request for Proposal (“RFP”) to engage an entity to complete this work. Hydro expects that the scope of the assessment will include but not necessarily be limited to:

- A full condition assessment of all major systems components of the Holyrood TGS units and plant, including internal inspections. This will also include a review of previously completed condition assessments including those conducted from 2011 through 2018;
- Development of an appropriate capital plan to support indefinite operations of these assets as generators;
- Identification of required operation and maintenance strategy for indefinite operation;
- Identification of required operator training and competency requirements;
- Review of unit start-up times including the physical and procedural changes required to reduce the same;

⁵ There is no change from the current plan for these projects.

⁶ It is assumed that this capital work would be deferred to occur once Holyrood TGS has been deemed not to be required for steam generation.

- Recommendations on minimum operating loads;
- Assessment of equipment lay-up requirements;
- Assessment of Unit 3 synchronous condenser conversion times;
- A review of standby operation targets in industry including recommendations;
- Recommendations on staffing level requirements; and
- Recommendations with respect to environmental considerations including legislative requirements and requirements for the Certificate of Approval to Operate, which is issued by the Provincial Government.

Hydro expects that once an entity is engaged, it will be able to provide a detailed schedule for the Board's consideration. Given that the detailed inspection contemplated will be required to take place during the maintenance season, Hydro anticipates the study will take approximately 10 months, which accounts for the staggering of annual maintenance outages on the units allowing for physical access to key equipment.

Following completion of this work, Hydro expects to file a report by January 29, 2021 detailing the requirements to support longer term, indefinite operation. This report will inform decision making with respect to the suitability of Holyrood TGS as a longer term back-up resource option. Hydro could then model the option as a candidate resource as part of its Reliability and Resource Adequacy assessment. Should Holyrood TGS be identified as the preferred solution, Hydro will submit any associated applications for capital expenditures as part of its 2022 Capital Budget Application, filed with the Board by August 1, 2021. Execution of Phase One would allow for sufficient time to fully assess and initiate any capital and operating requirements required to support Phase Two (longer-term operation). The following provides a summary of the anticipated completion of activities as previously described.

Activity	Anticipated Completion Date
Supplemental application for capital expenditure to complete major system review and life extension study for the Holyrood TGS filed with the Board	December 16, 2019
Issuance of RFP, pending approval of the supplemental application	December 31, 2019
Awarding of RFP	On or before February 28, 2020
Completion of work related to major system review and life extension study including final report	November 30, 2020
Results of the major system review and life extension study filed with the Board.	January 29, 2021

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



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