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January 16, 2019

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: Operation of Gas Turbines for Winter 2018-2019

As per the Board's correspondence dated December 10, 2018, please find enclosed one (1) original plus eight (8) copies of Newfoundland and Labrador Hydro's ("Hydro") report entitled "Concluding Report on Hydro's Generation Dispatch Approach."

Should you have any questions, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

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

cc: Gerard Hayes – Newfoundland Power
Paul Coxworthy – Stewart McKelvey
ecc: Sheryl Nisenbaum – Praxair Canada Inc.
Dean Porter – Poole Althouse
Dennis Browne, Q.C. – Browne Fitzgerald Morgan & Avis
Denis J. Fleming - Cox & Palmer
Larry Bartlett – Teck Resources Limited

CONCLUDING REPORT ON HYDRO'S GENERATION DISPATCH APPROACH

January 16, 2019

A Report to the Board of Commissioners of Public Utilities

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1.0 Background

On December 5, 2018, Hydro issued correspondence to Newfoundland Power, the Consumer Advocate, and the Island Industrial Customer Group ("Parties") with respect to Hydro's planned operation of its gas turbines for the upcoming winter season. Through that correspondence, Hydro requested that the Parties advise whether they believed a deviation from the planned dispatch of gas turbines was warranted and provide such feedback by December 21, 2018. Subsequent to Hydro's correspondence, the Board of Commissioners of Public Utilities ("Board") requested that Hydro submit to the Board by January 16, 2019 a report summarizing the feedback received and any impact the feedback will have on Hydro's planned operation of its gas turbines for the 2018/19 winter season. The requested report is attached.

2.0 Hydro's Correspondence

Hydro's previous correspondence on this matter, dated December 5, 2018, provided background information on its generation dispatch and a detailed explanation regarding its approach to reliability. In particular, that correspondence described:

- Hydro's current approach in which all generating assets in its fleet are dispatched in least-cost order to reliably meet its customer demand requirements (this generation dispatch approach ensures an appropriate balance between cost and reliability);
- quarterly reporting established to address a concern expressed by the Liberty Consulting Group ("Liberty") that stakeholders were unaware of the account balance in Hydro's Supply Cost Deferral Accounts;[1]
- customer views on reliability that had been shared with Hydro as part of its ongoing Reliability and Resource Adequacy Study;
- an overview of the newly available alternatives to higher cost generation that Hydro has implemented and others that Hydro continues to pursue; and

[1] The Supply Cost Deferral Accounts refers to the Isolated Systems Cost Variance Deferral Account, the Energy Supply Cost Variance Deferral Account, and the Holyrood Conversion Rate Deferral Account.

- a forecast of gas turbine energy production and fuel costs for 2019 to provide stakeholders with an indication of Hydro's anticipated production through the coming winter.

Further, in that correspondence, Hydro stated its belief that its current generation dispatch approach is consistent with generally accepted utility practice. This practice is consistent with the approaches of other utilities, as noted by Liberty.[2] Hydro stated its intent to continue with its current generation dispatch approach. This approach includes the dispatch of gas turbines as required to meet system reliability requirements when all other lower cost sources are exhausted. Hydro concluded its correspondence by seeking feedback from Parties as to whether they believed a deviation from the planned dispatch of the generation fleet is warranted.

In response to Hydro's request, Newfoundland Power replied by letter on December 21, 2018. No other replies were received.[3]

3.0 Newfoundland Power's Reply

Newfoundland Power indicated it was not in a position to recommend deviation from Hydro's planned generation dispatch. Newfoundland Power also provided its general views regarding certain aspects of Hydro's generation dispatch. These views were specifically focused around three themes:

1. whether Hydro's reliability approach strikes the appropriate balance of cost and reliability;
2. the relevance of practices in other jurisdictions and the opportunity to avail of access to less costly sources consistent with cost-effective, reliable service; and
3. the benefit of regular communication on generation dispatch matters.

[2] Analysis of Hydro's Energy Supply Cost Variance Deferral Account, June 22, 2018.

[3] While no other formal response to Hydro's correspondence was received, as Hydro has expressed in its correspondence, the Island Industrial Customers generally expressed alignment with Hydro's approach. The exception is Teck Resources which expressed a willingness to accept more frequent outages of longer duration in order to reduce electricity costs.

3.1 The Balance of Cost and Reliability

Cost benefit analysis is an important tool in ensuring efficient operation and can be applied in some utility decision making. In this instance, however, Hydro proposes such analysis would require an alternative which represents a deviation from a good utility practice. In any utility, there are a number of reasons upon which an investment can be justified: by cost-benefit analysis, on the basis of reliability, or both. Investments that benefit reliability can be justified on the basis of an eventual outcome or by being a generally accepted good utility practice, which reflects consideration of both least-cost and reliable service. Hydro believes the cost benefit analysis is satisfied in its already existing practice of economic dispatch of generation.

Hydro's full fleet of generation assets, which include its hydraulic assets; the Holyrood Thermal Generating Station ("HTGS"); the Holyrood, Stephenville, and Hardwoods gas turbines ("gas turbines"); and a number of smaller diesel units, are dispatched based on system requirements in least cost order. The degree to which the generation is dispatched under the economic priority guidelines depends on a number of factors including system demand requirements, the status of other generation (e.g., forced and planned outages to generating units and deratings), and transmission configurations (e.g., forced and planned outages to major transmission lines). Gas turbines are the highest cost source, and are dispatched when conventional generation (hydraulic generation or the HTGS) is insufficient to meet Hydro's reliability approach. Hydro maintains that it requires the ability to dispatch any and all of its installed assets to reliably supply customers in a least-cost manner, consistent with good utility practice.

3.2 Relevance of Practice in other Jurisdictions and Newly Available Economic Sources

While Hydro respects Newfoundland Power's view, Hydro continues to maintain that it is both appropriate and prudent for its generation dispatch criteria to reflect good utility practice. This requires a consideration of the practices or standards in other jurisdictions. Utilities often use other utility comparisons or industry associations (e.g. CEA) results and standards to help assess and guide performance and to inform future operation and investments. Good utility practices help ensure Hydro can provide the reliable service its customers expect.

Hydro is now interconnected to the North American grid. While this provides both economic and reliability benefits for Hydro and its customers, it also means that Hydro's operations can impact other jurisdictions. For example, the in-service of the frequency controller on the Maritime Link significantly reduces the likelihood of under-frequency load shedding events following the trip of one of Hydro's generating units.[4] In such an instance, the controller responds to the disturbance in Hydro's system by instantaneously providing power from Nova Scotia, thereby maintaining the Island frequency at an acceptable level. Hydro is obligated to return this power to Nova Scotia within 15 minutes, in compliance with Nova Scotia Power's Reliability Standards as members of the Northeast Power Coordinating Council ("NPCC").To ensure that such reliability benefits remain available to Hydro's customers, Hydro feels that it is important to position its power system accordingly, consistent with the expectations of neighbouring jurisdictions.

Hydro continues to seek newly available economic opportunities to access less costly power supply for the system, largely made possible by interconnection to the North American grid. Subsequent sections of this letter provide additional information on the opportunities Hydro has implemented to date and other opportunities it is pursuing.

3.3 Ongoing Communication

Hydro agrees with Newfoundland Power's position that continuing to communicate regularly on generation dispatch matters will improve Newfoundland Power's understanding of the emerging issues. Such communication will also ensure any questions and concerns can be addressed in a more timely manner. Ongoing engagement will further provide Hydro with a valuable opportunity to better understand Newfoundland Power's position on the many decisions that impact provincial electricity customers.

[4] Hydro estimates that the frequency controller action on the Maritime Link helped to avoid 11 under-frequency Load Shedding events and corresponding customer interruptions in 2018.

4.0 Moving Forward

Hydro acknowledges the magnitude of the costs incurred in providing this level of reliability in previous years. It notes, however, that these costs were primarily incurred as a result of the transmission constraints into the Avalon Peninsula, as well as the health of other generating assets. Most notably, the higher than anticipated unavailability of Holyrood units through the 2015-2018 period resulted in a requirement for materially increased standby production over levels forecasted in 2014. The addition of a third 230 kV transmission line (TL267) from Bay d'Espoir to the Avalon and the restored capability of the Holyrood units have reduced gas turbine operation observed through the fourth quarter of 2018 when compared to recent years.

Hydro expects the costs associated with providing this level of reliability to continue to decrease through 2019 and 2020 as other lower cost options are available to the Island Interconnected System.

Hydro has undertaken the following initiatives to reduce the system costs associated with satisfying Hydro's reliability approach:

1. use of economic imports over the Maritime Link to avoid operation of higher cost sources;
2. inclusion of capacity assistance product purchased from Corner Brook Pulp and Paper ("CBPP") as ten-minute reserve; [5] and
3. inclusion of Labrador-Island Link ("LIL") flows in real time, day-of, and day-ahead reserve assessments and forecasting.

Hydro continues to pursue opportunities as they are available.

[5] Scheduled for implementation by January 31, 2019.

4.1 Economic Imports over the Maritime Link

Near the end of winter 2018, the Maritime Link was placed into service. Since that time, Hydro has determined that supply over the Maritime Link can be used to reliably meet system demand requirements at a lower cost than the dispatch of Hydro's higher cost units, including gas turbines.[6] This has allowed Hydro to avoid starting and running gas turbines on a number of occasions in 2018. Hydro continues to pursue opportunities to reduce and displace higher cost sources through importing when possible.

4.2 Inclusion of Capacity Assistance as Ten-minute Reserve

Through recent system studies, Hydro determined that a portion of the interruptible load from CBPP can be used as 10-minute reserve.[7] This allows for a reduction in spinning reserve normally provided by on-Island generating sources. In this manner, following the loss of a large generating unit, the frequency controller of the Maritime Link will continue to activate to maintain the system frequency and avoid customer interruption. The CBPP load can then be interrupted to cover a portion of the generation loss and return the Maritime Link power to Nova Scotia within the time requirements specified in its Reliability Standards. Hydro is currently in the process of modifying its real-time reserve assessments and forecasts and expects to implement a portion of the CBPP interruptible load (40 MW) as 10-minute reserve prior to the end of January 2019.

4.3 Labrador-Island Link Flows in Reserve Assessments and Forecasting

Since December 14, 2018, testing activities on the LIL have resulted in increasing levels of power flow delivered to Soldiers Pond. To date, the maximum amount delivered has been approximately 140 MW, sourced from Recapture Energy.[8] Hydro has implemented a day ahead

[6] Subject to economic and technical analysis, completed by Hydro, in each instance.
[7] Made available under the existing Capacity Assistance Arrangement.
[8] On May 12, 1969, Hydro-Quebec (HQ) and CF(L)Co entered into a power contract for the purchase of power from the CF(L)Co plant by HQ (the "1969 Power Contract"). Pursuant to section 6.6 of the 1969 Power Contract, CF(L)Co has exercised its right to recapture 300 MW of power ("Recapture Energy") generated at the CF power plant. Under the terms of a PPA between Hydro and CF(L)Co (the NLH-CF(L)Co PPA) dated March 9, 1998, and amended on April 1, 1999, Hydro is able to, and does, purchase up to 300 MW of Recapture Energy from CF(L)Co for use outside of the Province of Quebec.

and real-time scheduling process for the Recapture Energy delivered to the Island over the LIL and the scheduled quantities are included in spinning and available reserve forecasts. The actual flows are included in real time reserve assessments and factored into generation dispatch decisions accordingly.

It is noted that since December 14, 2018, due to the availability of LIL flows and the improvement in the performance of the Holyrood units, dispatch of the Holyrood gas turbine to support reliability requirement has been required on only one occasion.

5.0 Conclusion

In response to the Board's request, this report summarizes the feedback received in response to Hydro's correspondence of December 5, 2018. Hydro thanks Newfoundland Power for the input provided as part of this process and looks forward to continuing to work together to achieve least-cost, reliable service to customers. Hydro will continue to engage with Newfoundland Power through existing committees and proactively in other meetings, when appropriate.

Hydro maintains its intent to continue with its current least-cost generation dispatch approach, which applies a reliability standard based on generally accepted good utility practice. With the addition of TL267, the restored capability of the Holyrood units, and the incorporation of newly available options to displace higher cost sources, Hydro expects that the costs to maintain the same level of reliability should be materially lower going forward than the costs incurred to provide this level of reliability in recent years. Hydro continues to believe that its reliability approach strikes an appropriate balance between cost and reliability in providing service to customers.