WHENEVER. WHEREVER.
We'll be there.

NEWFOUNDLAND POWER
A FORTIS COMPANY

HAND DELIVERED

October 6, 2017

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

Attention: G. Cheryl Blundon
Director of Corporate Services
and Board Secretary

Ladies & Gentlemen:

Re: Newfoundland and Labrador Hydro's 2018 Capital Budget Application – Brief of Argument

Enclosed are the original and 10 copies of Newfoundland Power's Brief of Argument.

For convenience, the Brief of Argument is provided on three-hole punched paper.

A copy of this letter, together with enclosure, has been forwarded directly to the parties listed below.

If you have any questions regarding the enclosed, please contact the undersigned at your convenience.

Yours very truly,

Gerard M. Hayes
Senior Counsel

c. Tracey Pennell
Newfoundland and Labrador Hydro

Paul Coxworthy
Stewart McKelvey

Dennis Browne, QC
Browne Fitzgerald Morgan & Avis

Newfoundland Power Inc.
55 Kenmount Road • P.O. Box 8910 • St. John's, NL A1B 3P6
PHONE (709) 737-5609 • FAX (709) 737-2974 • **ghayes@newfoundlandpower.com**

IN THE MATTER OF the *Public Utilities Act*, (the "Act"); and

IN THE MATTER OF an Application by Newfoundland and Labrador Hydro for an Order approving: (1) its 2018 capital budget pursuant to s.41(1) of the Act; (2) its 2018 capital purchases, and construction projects in excess of $50,000 pursuant to s.41 (3) (a) of the Act; (3) its leases in excess of $5,000 pursuant to s.41 (3) (b) of the Act; and (4) its estimated contributions in aid of construction for 2018 pursuant to s.41 (5) of the Act.

BRIEF OF ARGUMENT
OF
NEWFOUNDLAND POWER INC.

October 6, 2017

NEWFOUNDLAND POWER
A FORTIS COMPANY

CONTENTS

Page

1.0 INTRODUCTION 1

2.0 LEGISLATIVE FRAMEWORK.....1

3.0 2018 CAPITAL BUDGET 2
- 3.1 General.....2
- 3.2 Holyrood Gas Turbine Projects 2
- 3.3 Install Plant Heating System – Holyrood Thermal Generating Station.....7
- 3.4 Hardwoods and Stephenville Gas Turbine Projects.....9
- 3.5 Muskrat Falls to Happy Valley Interconnection.....12
- 3.6 Hydraulic Generation Refurbishment and Modernization.....14

1.0 INTRODUCTION

Newfoundland and Labrador Hydro's ("Hydro") 2018 Capital Budget Application (the "Application") was filed with the Board of Commissioners of Public Utilities (the "Board") on July 27th, 2017. Newfoundland Power filed a Notice of Intention to Participate in the hearing of the Application on August 10th, 2017.

This is Newfoundland Power's submission with respect to the Application.

2.0 LEGISLATIVE FRAMEWORK

Section 37(1) of the *Public Utilities Act* states that a public utility shall provide service and facilities that are reasonably safe and adequate and just and reasonable. Section 37(1) is a cornerstone of Hydro's and Newfoundland Power's obligation to serve their customers.

Section 3(b) of the *Electrical Power Control Act, 1994* states that all sources and facilities for the production, transmission, and distribution of power in the province should be managed and operated in a manner that would result in:

(i.) the most efficient production, transmission, and distribution of power,

(ii.) consumers in the province having equitable access to an adequate supply of power, and

(iii.) power being delivered to customers in the province at the lowest possible cost consistent with reliable service.

Section 3(b) does not create a hierarchy between these three principles; rather, each is equally important in the management and operation of electrical facilities in the province.

3.0 2018 CAPITAL BUDGET

3.1 General

The principal question for the Board in its consideration of this proceeding is whether Hydro's proposed capital expenditures as described in the Application are reasonably required for Hydro to meet its statutory obligation to provide reasonably safe and adequate, least cost service to its customers, including Newfoundland Power.

Newfoundland Power's submission on the Application includes submissions on proposed capital expenditures for: (i) the Holyrood Gas Turbine, (ii) a new Holyrood Thermal Generating Station Plant Heating System, (iii) the Hardwoods and Stephenville Gas Turbines, (iv) the Muskrat Falls to Happy Valley Interconnection, and (v) the Hydraulic Generation Refurbishment and Modernization project.

3.2 Holyrood Gas Turbine Projects

Background

The Holyrood Gas Turbine went into service in 2015. Since being placed in service, the Holyrood Gas Turbine has been utilized more frequently and for longer durations than was foreseen during engineering design of the unit. This has resulted in higher requirements for fuel delivery and for environmental emission control.

Reference: *Increase Fuel and Water Treatment System Capacity*, Application, Volume I, page C-9.

Increase Fuel and Water Treatment System Capacity

The *Increase Fuel and Water Treatment System Capacity* project involves installation of (i) additional water treatment equipment to increase the capacity to produce the demineralized water

used to reduce nitrous oxide emissions released into the environment ($946,700), and (ii) two 1.25 million litre fuel tanks to increase onsite fuel storage ($10,895,900).

Reference: *Increase Fuel and Water Treatment System Capacity*, Application, Volume I, page C-8; *Increase Fuel and Water Treatment System Capacity – Holyrood Gas Turbine*, Application, Volume II, Tab 2, pages 4 – 5.

In 2016, the Holyrood Gas Turbine requirement for demineralized water exceeded the capacity of the water treatment system on 16 occasions, leading to interruptions in nitrous oxide emission control. When operated in this fashion, generation from the Holyrood Gas Turbine is not compliant with the plant's Certificate of Approval issued pursuant to the *Environmental Protection Act*. The proposed increase in the capacity of the water treatment system therefore qualifies as a mandatory project within the meaning of the Capital Budget Application Guidelines. Newfoundland Power takes no issue with this aspect of the project.

Reference: *Increase Fuel and Water Treatment System Capacity – Holyrood Gas Turbine*, Application, Volume II, Tab 2, pages 8 - 9; Response to Request for Information NP-NLH-010.

Installation of two additional fuel tanks will double onsite fuel storage capacity, from 2.5 million litres to 5 million litres. Assuming the storage tanks are full, this will allow the Holyrood Gas Turbine to generate at 100% capacity for 5 days without any fuel deliveries, and for 10 days with normal daily fuel deliveries.

Reference: *Increase Fuel and Water Treatment System Capacity*, Application, Volume I, page C-9.

The longest period of time to date that the Holyrood Gas Turbine has run at 100% capacity is 14 hours. Despite several interruptions in fuel deliveries experienced in 2015, 2016 and 2017, including two delays of 48 hours, there have been no occasions to date when the unit could not

be used because of inadequate fuel supply. Hydro did not specify how it determined the proposed increase in fuel storage capacity of 2.5 million litres is reasonable.

Reference: Responses to Requests for Information PUB-NLH-023, PUB-NLH-024 and PUB-NLH-025.

Submission

The evidence indicates that the proposed expansion of the water treatment system is required for compliance with environmental regulations. Newfoundland Power submits that this aspect of the project should be approved.

Newfoundland Power supports reasonable expansion of the onsite fuel supply for the Holyrood Gas Turbine. It is respectfully submitted, however, that the evidence does not establish that an additional 2.5 million litres of fuel storage (as opposed to, say, 1.25 million litres) is required.

Turbine Hot Gas Path Level 2 Inspection and Overhaul

The *Turbine Hot Gas Path Level 2 Inspection and Overhaul* project is a two year project to complete a hot gas path inspection and overhaul on the gas turbine unit at the Holyrood Gas Turbine plant. The manufacturer of the unit recommends that a hot gas path level 2 inspection and overhaul be completed when total equivalent starts on the unit reaches 800. Hydro is currently forecasting that the unit will reach 800 total equivalent starts in 2019. The project budget estimate includes capital expenditures of $6.539 million in 2018 and $4.608 million in 2019.

Reference: *Turbine Hot Gas Path Level 2 Inspection and Overhaul,* Application, Volume I, page C-11.

Hydro carried out a combustion overhaul of the unit in 2016. The manufacturer recommended equivalent starts threshold for a combustion overhaul is 400. The Holyrood Gas Turbine had reached 326.3 equivalent starts at the time it was taken out of service for the combustion overhaul. Hydro was forecasting the unit to reach the 400 equivalent start threshold before the end of the 2016-2017 winter season. In order to avoid major maintenance on a standby generating unit during the winter operating season, Hydro completed the overhaul early.

Reference: *Turbine Hot Gas Path Level 2 Inspection and Overhaul*, Application, Volume I, page C-12; Response to Request for Information NP-NLH-015.

Hydro has indicated it will defer the planned hot gas path inspection and overhaul beyond 2019 if the 800 equivalent starts threshold is not met in 2019 as anticipated, provided the overhaul can be safely deferred beyond the end of the 2019-2020 winter operating season. According to Hydro, the timing of the overhaul will be based on the actual and forecast operation of the unit and will be completed as close as possible to the threshold while ensuring the unit's reliability through the next winter operating season.

Reference: Response to Request for Information NP-NLH-016.

Hydro proposes to award the contract for the hot gas path overhaul of the Holyrood Gas Turbine by April 2019.

Reference: *Turbine Hot Gas Path Level 2 Inspection and Overhaul – Holyrood Gas Turbine*, Application, Volume II, Tab 3, page 8.

Hydro's forecast of equivalent starts for the Holyrood Gas Turbine for 2019 does not include consideration of the completion of transmission line TL267 or the impending interconnections to Nova Scotia and Labrador. Hydro has indicated that the forecast which considers the completion

of these projects is still being developed.

Reference: Response to Request for Information NP-NLH-013.

Hydro's 2017 general rate application refers to a "reduced production forecast for Hydro's Island Interconnected System gas turbines and diesels for 2017 through the 2019 Test Year" reflecting the reliability benefit of the planned in service of transmission line TL267.

Reference: Newfoundland & Labrador Hydro - 2017 General Rate Application, Volume I, page 3.25.

Submission

Newfoundland Power submits that impending system changes, including the completion of transmission line TL267, may affect the number of equivalent starts for the Holyrood Gas Turbine. It is respectfully submitted that the Board should require that Hydro provide, with its next capital budget application, an updated equivalent starts forecast for the Holyrood Gas Turbine, together with information regarding the impact of the updated forecast on the schedule for the planned hot gas path overhaul.

Installation of Access Hatch

The *Turbine Hot Gas Path Level 2 Inspection and Overhaul* project includes a proposed capital expenditure of $1,025,800 to install an access hatch in the roof of the building that encloses the Holyrood Gas Turbine. The purpose of the access hatch is to allow major components to be lifted out of the powerhouse building and moved to a laydown area during the inspection and overhaul process.

Reference: *Turbine Hot Gas Path Level 2 Inspection and Overhaul*, Application, Volume I, page C-11; Response to Request for Information NP-NLH-009.

Installation of an access hatch was not included in the original 2015 construction of the Holyrood Gas Turbine building. Instead, the original construction allowed for deconstruction of a section of the building roof deck to allow for removal of major components during inspections. Hydro has since evaluated the cost of installing a removable roof hatch as compared to the original design, and has determined that it would be more cost effective to install the hatch. Hydro did not provide an explanation for why the more cost-effective access hatch was not included in the original design of the building.

Reference: Response to Request for Information NP-NLH-008.

Submission

Newfoundland Power does not take issue with the proposed installation of the access hatch, as the evidence indicates it is more cost-effective than the original design. However, Newfoundland Power submits that it is not reasonable that customers bear the incremental cost of providing for deconstruction of a section of the building roof deck in the original construction ***in addition to*** the cost of the access hatch. Newfoundland Power respectfully submits that Hydro should be required, prior to approval of inclusion of the access hatch in Hydro's rate base, to provide the Board with information showing why it is reasonable that customers bear the cost of both the provision for access in the original construction and the access hatch.

3.3 Install Plant Heating System – Holyrood Thermal Generating Station

Background

The *Install Plant Heating System* project involves capital expenditures totalling $5.685 million for the design, supply and installation of a new heating system for the powerhouse and pumphouse at the Holyrood Thermal Generating Station ("Holyrood"). Expenditures of $1.465

million are proposed for 2018 for detailed design and procurement. Expenditures of $4.22 million for installation and commissioning are proposed for 2019.

Reference: *Install Plant Heating System*, Application, Volume I, page C-13.

Hydro indicates the project is justified on the basis of a need for an alternative continuous source of heating for plant heating and freeze protection of equipment because Holyrood will remain in stand-by generation mode for a period time after the Lower Churchill Project is brought into service, and that a heating source will continue to be required after the stand-by period when Holyrood will operate as a synchronous condensing station.

Reference: *Install Plant Heating System,* Application, Volume I, page C-14.

Currently, steam extracted from one or more of the three Holyrood boilers is used for plant space heating. Considering the operational forecast for Holyrood, there will be no steam available for space heating during the stand-by period and thereafter when Holyrood is used only as a synchronous condensing station.

Reference: *Install Plant Heating System – Holyrood Thermal Generating Station*, Application, Volume II, Tab 4, page 1.

Hydro considered 2 plant heating system alternatives: (i) a steam-based system with the steam being produced by an auxiliary boiler; and (ii) a non-steam-based system using light fuel oil-fired heating units, and some electrical heating units in some areas where localized heating and freeze protection is required. Hydro's analysis determined that the non-steam-based system was the least-cost alternative, and had the further advantage that the equipment, including the heating

units, could be easily moved and re-arranged to accommodate future changes in operational plans.

Reference: *Install Plant Heating System – Holyrood Thermal Generating Station*, Application, Volume II, Tab 4, pages 3-5.

Hydro indicated that it considered an all-electric alternative for the plant heating system. For various reasons, Hydro concluded that an all-electric heating alternative was not practical. It is not apparent from the evidence that Hydro considered in its analysis the economics of the post-Muskrat Falls marginal cost of electricity or such practical considerations as the ability to use existing on-site stand-by electricity generation if necessary.

Reference: Response to Request for Information NP-NLH-017.

Submission

Newfoundland Power submits that a proposal for a new space heating system for Holyrood should include a detailed analysis of an all-electric space heating system that considers the post-Muskrat marginal cost of electricity and the practicality of using existing on-site stand-by generation in the event of emergency. Newfoundland Power respectfully submits that the Board should, prior to approving capital expenditures on a new heating system for Holyrood, direct Hydro to provide such an analysis for the Board's consideration.

3.4 Hardwoods and Stephenville Gas Turbine Projects

Background

Hydro's Hardwoods and Stephenville Gas Turbines are more than 40 years of age, exceeding the generally accepted life expectancy of 25 to 30 years for gas turbine plants. Hydro's 2018 Capital

Budget Application includes proposed 2018 capital expenditures of $1.456 million on the Hardwoods Gas Turbine and $0.9 million on the Stephenville Gas Turbine.

Reference: Response to Request for Information PUB-NLH-001.

In its submission on Hydro's 2017 Capital Budget Application, Newfoundland Power submitted as follows:

> …in addition to approving Hydro's proposed 2017 gas turbine expenditures, the Board should order Hydro to complete a comprehensive analysis of short and long term options related to the Hardwoods and Stephenville gas turbines as part of the report on the turbines ordered to be filed by November 30, 2016. The analysis should, at a minimum, consider the options of repowering and replacing the existing Hardwoods and Stephenville gas turbines with modern, reliable gas turbine technology.

Reference: Newfoundland Power Submission, Newfoundland and Labrador Hydro 2017 Capital Budget Application, October 7, 2016.

In Order No. P.U. 45(2016), approving Hydro's 2017 Capital Budget, the Board indicated it was satisfied that the current reporting requirements for the Stephenville and Hardwoods gas turbines should address the issues and concerns raised by Newfoundland Power. The Board further indicated that it expected the report to be filed by Hydro would be "a comprehensive review which will address the reliability of the units and impacts on the system for both the short and longer term."

Reference: Order No. P.U. 45(2016), page 5.

In its *Gas Turbine Failure Analysis, Final Report*, filed with the Board on January 11, 2017, Hydro indicated that it is currently evaluating the long term need and role for gas turbines on the Island Interconnected System, and that the evaluation would "inform if heavy investment into the Hardwoods and Stephenville current gas turbine engines is appropriate or if other options such as

repowering or replacing is more appropriate." Hydro indicated that it expected to complete this evaluation "as part of the Phase Two Outage Inquiry."

Reference: *Gas Turbine Failure Analysis, Final Report*, January 11, 2017, page 18.

In a report dated February 27, 2017, Liberty Consulting Group made the following recommendations with respect to the Hardwoods and Stephenville Gas Turbines:

> 5. Hydro should develop a "replacement plan" for the Hardwoods and Stephenville units with a recommendation for when the units will be retired.
> 6. Hydro should avoid significant investments in Hardwoods or Stephenville under the assumption that meaningful reliability improvements are not practical.

Reference: *Evaluation of Pre-Muskrat Falls Supply Needs and Hydro's November 30, 2016 Energy Supply Risk Assessment*, Liberty Consulting Group, February 27, 2017.

Since the filing of the referenced reports, no material update on the long-term need and role for gas turbines on the Island Interconnected System has been provided by Hydro.

Hydro's current estimate of planned capital expenditures for the Hardwoods and Stephenville Gas Turbines to their expected retirement dates of 2025 and 2028, respectively, totals $19.3 million.

Reference: Response to Request for Information NP-NLH-002.

Submission

Newfoundland Power respectfully submits that the proposed 2018 expenditures on the Hardwoods and Stephenville Gas Turbines appear necessary to maintain their operational reliability, and should be approved. However, in light of the apparent lack of progress on the matter to date, and the ongoing significant expenditure requirements associated with maintaining

the reliability of these aging units, Newfoundland Power respectfully submits that the Board should order Hydro to complete a comprehensive analysis of short and long term options for the Hardwoods and Stephenville Gas Turbines as soon as possible, including the options of repowering and replacing the existing units with modern, reliable gas turbine technology.

3.5 Muskrat Falls to Happy Valley Interconnection

Background

The *Muskrat Falls to Happy Valley Interconnection* project proposes tapping of transmission line TL 240 (also referred to as "L1301") at a location close to the Muskrat Falls 138kV/25 kV Tap Station ("MFATS3") and the addition of a six kilometer segment of 138 kV wood pole transmission line from MFATS3 to the Muskrat Falls 315 kV Terminal Station. The project entails capital expenditures of $17.7 million in 2018 and $2.2 million in 2019. Hydro has indicated that the project is necessary to increase the capacity of the transmission system supplying the Upper Lake Melville area to reliably support load levels in the area.

Reference: *Muskrat Falls to Happy Valley Interconnection*, Application, Volume I, page C-44-45.

In support of the project, Hydro submitted a report which presented 6 options to address the immediate load growth, of which 5 were considered in detail. The option chosen is identified as Option 2 in the report.

Reference: *Eastern Labrador Transmission System – Planning Report*, Application, Volume II, Tab 13, Appendix A.

Hydro has indicated that its "vision for power supply to the Happy Valley-Goose Bay system is a two phased approach." Phase I is the proposed 2018-2019 project. Hydro has indicated it will continue to monitor load growth in Labrador and will submit a capital budget application for the

construction of Phase II when load forecasts indicate loads will exceed the capacity of the Phase I interconnection.

Reference: *Eastern Labrador Transmission System – Planning Report*, Application, Volume II, Tab 13, Appendix A, page 30 of 74.

There is evidence on the record indicating potential savings associated with eliminating the costs of the wood pole management associated with the 138 kV transmission line from Churchill Falls to Happy Valley (L1301), the Churchill Falls Terminal Station and MFATS3. Further savings could be realized if the existing 25 MW gas turbine at Happy Valley were removed from service. The existing gas turbine would not be required if a second 138 kV transmission line from Muskrat Falls to Happy Valley-Goose Bay was constructed, as envisioned under Options 4 and 5. System changes that would include these savings have not been considered in the current planning study.

Reference: Responses to Requests for Information NP-NLH-025 and NP-NLH-026.

Submission

Newfoundland Power acknowledges that the evidence indicates Hydro is required to undertake capital expenditures in the 2018-2019 timeframe to address load growth in the Upper Lake Melville area. However, proceeding with Phase I in the absence of a more fulsome consideration of possible Phase II configurations may not be consistent with the provision of least cost service. There is evidence on the record of this proceeding that there are savings associated with possible system changes that have not been considered in the planning study filed in support of the *Muskrat Falls to Happy Valley Interconnection* project as proposed. Newfoundland Power submits that Hydro has not demonstrated that the project as proposed is consistent with the least cost provision of service to Hydro's customers.

Newfoundland Power respectfully submits that, prior to approving the *Muskrat Falls to Happy Valley Interconnection* project, the Board should direct Hydro to revise its planning study to include consideration of whether other options, including elimination of transmission line L1301 and the existing gas turbine, among others, may be more cost-effective than the project as currently proposed. If undertaken in a timely manner, the reconsideration of available options should not materially alter the proposed project schedule.

3.6 Hydraulic Generation Refurbishment and Modernization

Background

Commencing with the 2018 Capital Budget Application, Hydro has consolidated much of its hydraulic generation capital work into one project. The *Hydraulic Generation Refurbishment and Modernization* project proposes capital expenditures totalling $14.6 million over a 2-year period. In the presentation of the Application, Hydro has classified the proposed expenditures as Normal.

Reference: *Hydraulic Generation Refurbishment and Modernization,* Application, Volume I, pages C-4 and C-5.

The Capital Budget Application Guidelines (the "Guidelines") define Normal Capital as "a capital expenditure that is required based on identified need or on historical patterns of repair and replacement." The Guidelines specify the supporting information to be submitted in support of proposed Normal Capital expenditures as follows:

> In relation to normal capital expenditures a utility must show, where appropriate:
>
> 1. There is evidence of the need, ie. historical spending patterns, maintenance history, reliability data, growth;
> 2. All reasonable alternatives, including deferral, have been considered;

3. The expenditure as proposed is the least cost option;
4. Unit and/or aggregate cost data including, where available, similar costs for the preceding five (5) years; and
5. Net Present Value (NPV).

Reference: *Capital Budget Application Guidelines, October 2007*, page 6 of 11.

The Guidelines require the segmentation of capital expenditures by materiality. Capital expenditures are segmented as follows: (i) Expenditures under $200,000; (ii) Expenditures between $200,000 and $500,000; and (iii) Expenditures over $500,000. According to the Guidelines, expenditures over $500,000 are considered "significant expenditures which must be supported with more comprehensive and detailed documentation than other expenditures."

Reference: *Capital Budget Application Guidelines, October 2007*, pages 6 and 8 of 11.

Hydro's report filed in support of the *Hydraulic Generation Refurbishment and Modernization* project outlines Hydro's philosophies for the assessment of equipment and the selection of capital work for the project.

Reference: *Hydraulic Generation Refurbishment and Modernization*, Application, Volume II, Tab 1, page i.

In a number of instances of proposed 2018 capital expenditures under the *Hydraulic Generation Refurbishment and Modernization* project, the supporting report does not include comprehensive and detailed documentation as required by the Guidelines. Instead, the expenditure proposals are presented with reference to generic descriptions of how such equipment is assessed and what the work entails. The presentation lacks information with respect to specific assessment of the condition of the assets for which capital expenditures are proposed. Examples of such expenditure proposals unsupported by comprehensive and detailed documentation include

proposed 2018 capital expenditures of $2.0 million for Turbine Major Refurbishment and $2.8 million for Refurbish Surge Tanks.

Reference: *Hydraulic Generation Refurbishment and Modernization*, Application, Volume II, Tab 1, pages 5 and 7.

Submission

Newfoundland Power submits that the evidence filed in support of a number of the capital expenditure proposals included in the *Hydraulic Generation Refurbishment and Modernization* project does not meet the requirements of the Guidelines. Newfoundland Power respectfully submits that the Board should not approve capital expenditure proposals included in the *Hydraulic Generation Refurbishment and Modernization* project where such proposals are not supported by evidence meeting the requirements of the Guidelines.

RESPECTFULLY SUBMITTED at St. John's, Newfoundland and Labrador, this 6th day of October, 2017.

NEWFOUNDLAND POWER INC.
P.O. Box 8910
55 Kenmount Road
St. John's, Newfoundland A1B 3P6

Telephone: (709) 737-5609
Telecopier: (709) 737-2974