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April 4, 2023

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

Dear Ms. Blundon:

**Re: 2023 Supplemental Capital Expenditure Application – Memorial Substation
Power Transformer Replacement**

A. Introduction

On March 3, 2023, Newfoundland Power Inc. ("Newfoundland Power" or the "Company") filed an application for the approval of supplemental capital expenditures for the *Memorial Substation Power Transformer Replacement* project (the "Application"). The Application proposes to replace Memorial ("MUN") Substation power transformer MUN-T2 at a cost of \$1,614,000 over two years, including \$48,000 in 2023 and \$1,566,000 in 2024.

The Application includes a project description and detailed engineering report in compliance with requirements of the Board's *Capital Budget Application Guidelines (Provisional)* (the "Provisional Guidelines"). These materials demonstrate that the *Memorial Substation Power Transformer Replacement* project is justified as being required to provide safe, adequate and reliable service to Memorial University's (the "University") St. John's campus.

The Board established a review schedule for the Application on March 7th that provided for requests for information and comments from the parties. Newfoundland Power filed responses to 35 requests for information received from the Board, Consumer Advocate and Newfoundland and Labrador Hydro ("Hydro") on March 23rd. Comments on the Application were filed by Hydro and the Consumer Advocate on March 28th and 29th, respectively.

Newfoundland Power's comments provide background information on the Application and respond to the comments filed by Hydro and the Consumer Advocate.

B. Background

MUN Substation is a 12.5 kV distribution substation located on the University's St. John's campus. Newfoundland Power has owned and operated equipment at MUN Substation since

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1966. All electrical equipment within the substation is owned and operated by the Company with the exception of customer-owned switchgear and associated distribution infrastructure.¹

MUN Substation has two power transformers, MUN-T1 and MUN-T2. MUN-T1 is 14.83 MVA power transformer that is original to the substation. MUN-T2 is a 20 MVA power transformer that was added in 1976 in response to load growth at the University. The growth experienced at that time was driven by construction of the Health Sciences Centre and other facilities on the University campus.²

MUN Substation served as the sole source of supply for the University campus until Long Pond ("LPD") Substation was constructed in 2019. LPD Substation was constructed as a special facility to: (i) provide redundancy to the University campus, primarily the Health Sciences Centre; and (ii) increase flexibility to accommodate future load growth and maintenance activities. The construction of LPD Substation was funded through a Contribution in Aid of Construction from the University of approximately \$4.0 million. The University's contribution included the capital cost to construct the substation and an allowance for future operating and maintenance costs. Requiring a customer contribution for the construction and operation of special facilities is consistent with Clause 9(c) of Newfoundland Power's *Schedule of Rates, Rules and Regulations*.³

In August 2022, Newfoundland Power was notified by the University that MUN-T2 was experiencing abnormal noise and temperature levels. MUN-T2 was removed from service to permit a condition assessment. The assessment included oil sampling, an internal inspection and a review by an independent consultant with expertise in power transformers, van Kooy Transformer Consulting Services Inc. ("van Kooy"). The assessment determined that MUN-T2 is experiencing a rare form of core deterioration that results in a high probability of failure.⁴

Newfoundland Power has not previously experienced this failure mode. While industry experience suggests the core of MUN-T2 will continue to deteriorate, there is no standard practice to monitor changes in its condition while the power transformer is in service. Based on uncertainties associated with the identified failure mode and the potential for a severe failure, Newfoundland Power determined that MUN-T2 cannot safely be returned to service.⁵

With MUN-T2 removed from service, MUN Substation is no longer capable of carrying the full load of the University. The University's load is currently being shared amongst power transformer MUN-T1 at MUN Substation and its redundant supply point, LPD Substation. A failure of either MUN-T1 or LPD Substation would result in an extended outage to the University until a portable substation could be installed. This effectively means the University is currently

¹ See the Application, Schedule B, Section 1.0 Introduction, and the response to request for information CA-NP-005.

² See the Application, Schedule B, Section 2.0 Background.

³ See the response to Request for Information NLH-NP-001.

⁴ See the Application, Schedule B, Section 2.0 Background.

⁵ See the response to request for information CA-NP-023.

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without the redundancy and operational flexibility for which it paid approximately \$4.0 million in 2019.⁶

Addressing the deteriorated condition of MUN-T2 is necessary to restore the capacity of MUN Substation in order to meet the Company's statutory obligation to provide safe, adequate and reliable electrical service to its customer. Restoring the capacity of MUN Substation is necessary to ensure LPD Substation continues to provide the intended level of redundancy and operational flexibility. Without restoring this service, the University will continue to be exposed to higher risks of prolonged outages.⁷

Newfoundland Power assessed alternatives to address the deteriorated condition of MUN-T2. The assessment confirmed it is necessary to procure a replacement for MUN-T2 in 2023 with installation in 2024.⁸

This project was not anticipated at the time of filing Newfoundland Power's *2023 Capital Budget Application* as inspection results collected at that time for MUN-T2 appeared normal. The project cannot be deferred until Newfoundland Power's next capital budget application due to extended delivery times for power transformers. Based on recent experience, delivery times for power transformers currently average 43 weeks. Deferring the replacement of MUN-T2 until Newfoundland Power's *2024 Capital Budget Application* would defer the replacement of MUN-T2 until 2025. This would expose the University's campus, including the Health Sciences Centre, to a higher risk of prolonged outages for an unacceptably long period of time.⁹

C. Newfoundland Power's Response to Comments

Neither Hydro nor the Consumer Advocate contest the fact that MUN-T2 has failed and requires replacement. The principal issue of the parties is whether the University should bear the cost of its replacement. The Consumer Advocate's comments also identify other issues relating to Newfoundland Power's management of its substation assets. The issues raised by Hydro and the Consumer Advocate are addressed below.

Response to Hydro's Comments

Hydro's comments note that it does not dispute that MUN-T2 has failed and does not oppose its replacement. Hydro believes that the project should be fully funded by the customer and that the Board should require Newfoundland Power to enter into an agreement with the University to establish a customer contribution for the total capital cost of the project. Hydro goes on to question whether the lack of a customer contribution towards this project could create concerns of subsidization among ratepayers.¹⁰

⁶ See the response to request for information CA-NP-003.

⁷ See the Application, Schedule B, Section 3.0 Risk Assessment.

⁸ See the Application, Schedule B, Section 4.0 Assessment of Alternatives.

⁹ See the Application, Schedule B, page 9 and the response to request for information CA-NP-004.

¹⁰ See Hydro's comments on the Application, page 1 to 2.

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Hydro's position is based on its interpretation that MUN-T2 constitutes a special facility that requires a customer contribution in accordance with Clause 9(c) of Newfoundland Power's *Schedule of Rates, Rules and Regulations*.¹¹

Newfoundland Power submits Hydro's position does not reflect the information on the record of this proceeding.

MUN Substation and its power transformers do not constitute special facilities.¹² MUN Substation is the original point of supply for the University. LPD Substation is the redundant supply point and was funded by the customer as a special facility. LPD Substation was considered a special facility specifically because there was already adequate capacity available at MUN Substation to serve the University load at that time.¹³

Newfoundland Power submits it would not be appropriate to require a customer contribution for the replacement of MUN-T2.

Replacing MUN-T2 is necessary to restore the capacity that has been available at MUN Substation for the past 47 years. The capacity available at MUN Substation is the basis upon which LPD Substation was determined to be a special facility. Restoring the capacity of MUN Substation is necessary to allow LPD Substation to serve its intended purpose as a source of redundancy and operational flexibility. Failing to replace MUN-T2 would call into question whether LPD Substation continues to be a special facility and whether the original requirement for a customer contribution towards that facility remains appropriate.

Requiring a customer contribution towards the replacement of MUN-T2 would effectively mean *both* MUN and LPD substations would be considered special facilities. There is no precedent for reprofiling a customer's original electrical service, which has existed for decades, as a special facility on an *ex post facto* basis.

Furthermore, Newfoundland Power observes that its cost of service methodology ensures fairness in the revenues collected from each class of service, including Rate 2.4 General Service (1000 kVA and Over) under which the University is served. The most recent cost of service study was presented in the Company's *2022/2023 General Rate Application*. The study results were accepted for use in establishing customer rates, which ultimately formed part of a settlement agreement reached in relation to that application and were approved by the Board in Order No. P.U. 3 (2022).

¹¹ See Hydro's comments on the Application, page 2.

¹² See the response to request for information NLH-NP-002.

¹³ See the response to request for information NLH-NP-001.

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Response to the Consumer Advocate's Comments

The Consumer Advocate's comments state that it would not oppose the replacement of MUN-T2 if it was paid for by the University.¹⁴ As described in response to Hydro's comments, MUN-T2 does not constitute a special facility and does not warrant a customer contribution.

Other issues raised by the Consumer Advocate include:

(i) *Funding availability under 2023 Capital Budget.*

The Consumer Advocate asserts that the replacement of MUN-T2 could be accomplished using funds approved as part of Newfoundland Power's 2023 Capital Budget. Options cited by the Consumer Advocate include the *Substation Replacements Due to In-Service Failures* program, *Allowance for Unforeseen Items* or the *Substation Spare Power Transformer Inventory* project.¹⁵

Newfoundland Power submits there are no previously approved funds available under its 2023 Capital Budget to facilitate the replacement of MUN-T2. Each of the previously approved expenditures cited by the Consumer Advocate were evaluated and ruled out prior to filing the Application.

The *Substation Replacements Due to In-Service Failures* program is required to address substation equipment that has failed in service. Substation equipment that fails in service requires immediate attention as it is essential to the reliability of supply to customers. The 2023 budget for this program is based on a historical average. Costs associated with the replacement of power transformers comparable to MUN-T2 have not historically been included in this program due to the substantial costs. The program budget is accordingly not designed to accommodate work of this magnitude. Newfoundland Power therefore ruled out use of this program to replace MUN-T2 as it would likely either hinder the completion of critical work in substations or expose the program to the risk of a substantial variance.¹⁶

Newfoundland Power also considered and ruled out use of the *Allowance for Unforeseen Items* to facilitate replacement of MUN-T2. The Board's Provisional Guidelines state that this allowance permits a utility to act expeditiously to deal with events that cannot wait for Board approval as any delay would have serious negative consequences. Given the University's redundancy at LPD Substation mitigated an outage upon the failure of MUN-T2, Newfoundland Power determined the circumstances did not warrant use of the *Allowance for Unforeseen Items*.¹⁷

¹⁴ See the Consumer Advocate's comments on the Application, page 7.

¹⁵ See the Consumer Advocate's comments on the Application, page 5.

¹⁶ See the response to request for information CA-NP-004, part b.

¹⁷ See the response to request for information CA-NP-013.

Additionally, there would be no benefits associated with redirecting funds approved for the *Spare Power Transformer Inventory* project to replace MUN-T2. The *Spare Power Transformer Inventory* project involves procuring a spare unit to serve as an emergency backup for a significant number of Newfoundland Power's in-service power transformers. Power transformer MUN-T2 has a configuration that is not common in the Company's system and does not match the specifications of the more adaptable spare unit to be purchased in 2023. Redirecting funds approved for one project to another with a different scope and rationale would require further review of the Board and would not yield any procedural efficiencies in comparison to a supplemental application. If funds were approved to be redirected, no cost savings would be realized as the procurement of a spare unit would still be required to mitigate increasing risks of outages to Newfoundland Power's customers due to its aging power transformers.¹⁸

(ii) *Newfoundland Power's inspection and maintenance program.*

The Consumer Advocate questions the adequacy of Newfoundland Power's inspection and maintenance program for its power transformers. Specifically, the Consumer Advocate questions how Newfoundland Power missed the deteriorated condition of MUN-T2 given the Company visited the substation numerous times to complete inspections and maintenance over a 32-month period. The Consumer Advocate states the Board should direct Newfoundland Power to review its inspection and maintenance practices to determine whether training is adequate and improvements are required to reflect industry best practices.¹⁹

Newfoundland Power submits the failure of MUN-T2 does not provide a basis upon which to question the adequacy of its inspection and maintenance practices for power transformers.

Standard industry inspection practices for power transformers include oil sampling, dissolved gas analysis, infrared scans and visual inspections of external components. Newfoundland Power applies these standard practices in inspecting its power transformers, including MUN-T2.²⁰

The record of this proceeding establishes that MUN-T2 is experiencing a rare form of core deterioration that could not be detected using standard inspection practices. Independent consultant van Kooy confirmed there is no standard practice to monitor the condition of a power transformer's core while a unit is in service.²¹ Rather, identifying this condition requires removing a unit from service, partially draining the oil and inspecting internal components. Internal inspections are typically only

¹⁸ See the response to request for information CA-NP-001, part b.

¹⁹ See the Consumer Advocate's comments on the Application, page 5.

²⁰ See the response to request for information PUB-NP-002, part b.

²¹ See the Application, Schedule B, Appendix C, page 3.

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completed for existing power transformers to diagnose a failure and are not standard practice for routine inspections.²²

Newfoundland Power completed an internal inspection of MUN-T2 to diagnose its suspected failure upon reports of abnormal noise and temperature levels. This practice is appropriate. It would not be reasonable to modify Newfoundland Power's inspection practices to require intrusive testing to identify a rare failure mode that has occurred only once in the Company's history.

(iii) *Newfoundland Power's spare power transformer inventory.*

The Consumer Advocate questions the adequacy of Newfoundland Power's spare power transformer inventory given there is no spare available that matches the specifications of MUN-T2. The Consumer Advocate states the Board should direct the Company to develop a comprehensive spare power transformer plan.²³

Newfoundland Power submits that the unavailability of a spare power transformer to replace MUN-T2 does not call into question the adequacy of the Company's inventory of spares.

Newfoundland Power maintains an inventory of spare power transformers to deploy in response to equipment failures. The Company's *2023 Capital Budget Application* included a project to purchase a 25 MVA power transformer to maintain adequate inventory levels. The specifications for the spare unit were selected to provide the maximum coverage for in-service power transformers. Maximizing the coverage provided by the spare unit maximizes its risk mitigation value as it increases the likelihood that a spare would be available in the event of a failure.²⁴

As described above, power transformers matching the specifications of MUN-T2 are not common within Newfoundland Power's electrical system. MUN-T2 is a 15/20 MVA, 66-12.5 kV power transformer with a Delta-Wye grounded winding configuration. There are only 10 power transformers in Newfoundland Power's electrical system that match these specifications. The procurement of a spare unit for these power transformers has not yet been prioritized.

Newfoundland Power intends to continually assess its inventory requirements based on up-to-date information on equipment failures, the availability of spares, the utilization of portable substations and other factors. The Company's approach remains appropriate under the current circumstances.²⁵

²² See the response to request for information CA-NP-015, part d.

²³ See the Consumer Advocate's comments on the Application, page 5.

²⁴ See the response to request for information CA-NP-001, part f.

²⁵ See the response to request for information CA-NP-001, part d.

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(iv) Existing redundancies and back-up supply.

The Consumer Advocate requests the Board direct Newfoundland Power to file an explanation as to why the level of supply security provided to the University is warranted. In describing this supply security, the Consumer Advocate lists LPD Substation, the two power transformers at MUN Substation, customer-owned emergency backup generation and fuel switching options, and Newfoundland Power's portable substations and spare power transformer inventory.²⁶

As explained above, LPD Substation was funded by the University as a second supply point. The University requested this facility primarily to provide redundancy to the Health Sciences Centre and improve operational flexibility. A customer contribution was required for LPD Substation because MUN Substation had sufficient capacity to carry the full campus load at that time. The replacement of MUN-T2 is required in order for MUN Substation to have the capacity to supply the campus load and to allow LPD Substation to serve its intended purpose as a redundant supply point.²⁷

With respect to customer-owned backup generation and fuel-switching opportunities, these are contingencies that the University owns and maintains. These contingencies help to reduce the impact of an outage to the University, but do not absolve Newfoundland Power of its statutory obligation to provide adequate supply to the University as one of its customers.²⁸

With respect to Newfoundland Power's portable substations and spare power transformers, these assets support the Company's ability to respond to equipment failures throughout its 131 substations. These assets are not intended to specifically serve the University.

(v) The urgency to replace MUN-T2.

The Consumer Advocate asserts the record suggests there is no immediate urgency to replace MUN-T2. The Consumer Advocate's assertion is based on the notion of locating a portable substation at MUN Substation and Newfoundland Power's decision to proceed via an application for the approval of supplemental capital expenditures.²⁹

Newfoundland Power submits the record of this proceeding does not suggest a lack of urgency in replacing MUN-T2.

Newfoundland Power has a limited fleet of four portable substations. These portable substations are deployed throughout the year to maintain service to customers

²⁶ See the Consumer Advocate's comments on the Application, page 5 to 6.

²⁷ See the response to request for information NLH-NP-001.

²⁸ See the response to request for information CA-NP-019, part b.

²⁹ See the Consumer Advocate's comments on the Application, page 6.

during substation maintenance, capital projects and equipment failures. The Company aims to manage the availability of its portable substations to ensure a unit is always available. A unit could not be stationed continuously at MUN Substation until 2024 without compromising the overall availability of portable units. As such, Newfoundland Power has increased its monitoring of MUN Substation and will deploy a portable if changes in the condition of equipment warrant.³⁰

Additionally, applications for the approval of supplemental capital expenditures are a necessary feature of the regulatory process to permit a utility to act upon unanticipated events. The failure of MUN-T2 was not anticipated at the time of filing Newfoundland Power's *2023 Capital Budget Application*. As described above, there is no previously approved capital project or program under which the replacement of MUN-T2 could be accommodated. Specific Board approval is therefore required prior to proceeding with its replacement.³¹

Newfoundland Power's determination that an application for the approval of supplemental capital expenditures was appropriate for the replacement of MUN-T2 considering the criticality of MUN-T2 and recent delivery times for power transformers. Based on recent experience, the average delivery time for power transformers is 43 weeks. Deferring this project until the Company's *2024 Capital Budget Application* would defer the installation of a replacement power transformer to 2025, thereby exposing the University to a higher risk of prolonged outages for an additional year.³² Given the critical nature of the University's load, including supply to the province's chief medical facility, such a delay would be inappropriate. Consequently, the Company's assessment is that the urgency necessitated the filing of an application for the approval of supplemental capital expenditures.

D. Conclusion

Newfoundland Power submits the record of this proceeding demonstrates that the replacement of failed power transformer MUN-T2 is justified as being required to provide safe, adequate and reliable service to the University campus and should be approved.

Hydro and the Consumer Advocate do not contest that MUN-T2 has failed and requires replacement. Rather, the parties believe MUN-T2 constitutes a special facility and the University should bear the cost of its replacement. Newfoundland Power, as a public utility, has a legal duty to supply electrical service to all who seek it on an equitable basis. The Company's comments explain that MUN Substation and its power transformers do not constitute special facilities. It would be inappropriate to require a contribution from the University to restore the original supply point from which it has received service for decades. Accordingly, Newfoundland Power submits the Application should be approved as filed.

³⁰ See the response to request for information PUB-NP-002, part e.

³¹ See the response to request for information CA-NP-004.

³² See the response to request for information CA-NP-004, part e.

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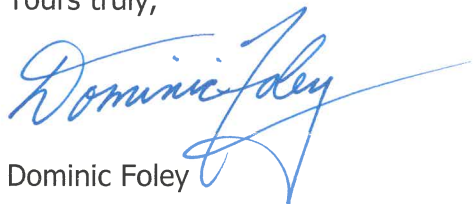
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If you have any questions regarding the enclosed, please contact the undersigned.

Yours truly,



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