Q. (Reference Application)

Please provide NP's long-term supply plan for Memorial University including a detailed load forecast and an explanation of how government zero carbon efforts are expected to impact the load on the MUN Substation. Please explain 1) how the proposed transformer replacement project ties in with NP's long-term supply plan and why it is suitable to replace the transformer at this time given government zero-carbon efforts, and 2) how customers are expected to benefit from the transformer replacement over the longer term, thus providing confidence that the transformer will not become a stranded asset.

A. Newfoundland Power has an obligation to provide its customers with equitable access to an adequate supply of power. Memorial University is the Company's largest single customer. Newfoundland Power consults with the university to understand changes in its load and to ensure an adequate supply of power.

Two substations provide service to Memorial University's St. John's campus. These are Memorial ("MUN") and Long Pond ("LPD") substations.

Table 1 provides a load forecast by power transformer for Memorial University, including both MUN and LPD substations, for the next five years.

Table 1
Memorial University
Load Forecast (2023-2027)
(MVA)

Transformer	2023	2024	2025	2026	2027
MUN-T1	3.87	3.87	3.87	3.87	3.87
MUN-T2	6.18	6.18	6.18	6.18	6.18
LPD-T1[1]	9.40	18.00	20.00	20.00	20.00
LPD-T2[2,3]	-	18.00	20.00	20.00	20.00
Total[4]	19.45	46.05	50.05	50.05	50.05

1 The construction of LPD Substation was approved by the Board in Order No. P.U. 5 (2019). The construction of the substation was completed following a request from the university to: (i) improve electrical reliability and provide an increased level of redundancy of utility supply to the Health Sciences Centre and the rest of the St. John's campus; and (ii) increase capacity flexibility on the university's existing 12.47 kV distribution system to better accommodate forecast load growth and future maintenance activities.

2 The addition of a second power transformer at LPD Substation was approved by the Board as part of the *2023 Capital Budget Application*. See Board Order No. P.U. 38 (2022).

3 The forecast 25 MW load associated with the new electric boilers is shown as being shared between both LPD-T1 and LPD-T2 power transformers in the university load forecast.

4 Non-coincident peak.

The forecast load at Memorial University is expected to reach 50 MVA in the next two years. This is primarily a result of the university's addition of electric boilers to its oil-fired boiler system. This project is being executed using funding from the provincial and federal governments to help meet net zero objectives.[5]

In addition, the university is forecasting additional load for the Harsh Environment Research Facility and the new Adult Mental Health and Addictions Facility. These facilities are expected to increase the total forecast load of the University by approximately 6 MW.[6]

Newfoundland Power's consultation with Memorial University on its load requirements informed the development of the *Long Pond Substation Capacity Expansion* project included in the Company's *2023 Capital Budget Application*. This project ensures Newfoundland Power's supply will meet the future requirements of the university.

The replacement of power transformer MUN-T2 is required to return MUN Substation to its normal configuration. Memorial University is currently dependent upon MUN-T1 to carry its full load, which represents about half the total load of the university. The remaining university load is carried by LPD Substation.[7] As a result, the university has lost the typical redundancy and operational flexibility provided by the substations. This exposes it to a higher risk of outages in the event of a failure of MUN-T1 or LPD Substation. Returning MUN Substation to its normal configuration will benefit the customer by restoring its redundancy and operational flexibility, thereby mitigating this risk.[8]

Load growth at Memorial University due to net zero initiatives is not expected to result in MUN-T2 becoming a stranded asset. Newfoundland Power's supply plan accounts for electrification efforts currently being undertaken by the university. Power transformer MUN-T2 will continue to be required to provide reliable service to the university following the expansion of LPD Substation. Should additional capacity be required in the future, all available options would be considered, such as increasing the capacity of MUN-T1. Newfoundland Power will continue to consult with Memorial University to understand any future changes in its load to ensure supply plans remain adequate.

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5 In March 2022, the Provincial and Federal Governments announced a $10.5 million project to install electric boilers at Memorial University. This project was jointly funded by the provincial and federal governments through Newfoundland and Labrador's *Climate Change Challenge Fund*. This fund is a competitive grant-based program under the *Low Carbon Economy Leadership Fund* to support greenhouse gas reduction projects. See Provincial Government press release, *Provincial and Federal Governments Invest in Electrification Project at Memorial University*, March 25, 2022.

6 An additional 1 MW of load is forecast for the Core Science Facility as it continues to ramp up operations.

7 The current maximum coincident load on MUN Substation and LPD Substation is approximately 19 MVA. Approximately half of this load is able to be transferred from MUN Substation to LPD Substation. The university does not have the distribution infrastructure in place to allow for the transfer of all MUN Substation loads over to LPD Substation.

8 LPD Substation was constructed in 2019 through a contribution from Memorial University. See the response to Request for Information NLH-NP-001.

Additionally, Newfoundland Power observes that power transformers removed from service due to load growth generally face a low risk of becoming stranded as they are typically redeployed to serve as emergency spares.