Q. (Reference Application Volume 2, 2021 Additions Due to Load Growth) Please demonstrate how NP has incorporated customer preferences, planning criteria, system reliability, asset condition and benchmarking for this project. Please identify the risk impacts of not proceeding with this project in 2021 both in terms of the probability of failure and the consequences of failure.

A. See the response to Request for Information CA-NP-008 for information on how Newfoundland Power incorporates customer preferences into its *2021 Capital Budget Application*.

See the response to Request for Information CA-NP-007 for information on how Newfoundland Power incorporates benchmarking into its *2021 Capital Budget Application.*

The *Additions Due to Load Growth* project is justified on the obligation to provide customers with equitable access to an adequate supply of power.[1] Expenditures included in the project are necessary to address overload conditions on the Company's electrical system.[2] Capital expenditures included in the 2021 *Additions Due to Load Growth* project include: (i) the new Airport Substation; and (ii) additional transformer capacity at the Dunville ("DUN") substation.[3] These projects are driven by Newfoundland Power's planning criteria, which is consistent with sound public utility practice.[4]

Assessing the need to address system load growth and overload conditions involves the annual completion of system studies and load forecasts to identify technical constraints on the electrical system. In the case of substation transformers, an engineering study is completed to identify and evaluate technical alternatives in advance of the overloads.[5]

In 2020, Newfoundland Power completed the *Dunville Load Growth Study* (the "Dunville Study") to assess load growth in the Dunville area and to consider alternatives to avoid overloading.[6] In the winter of 2021, the substation transformer at DUN substation is

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1 Section 3(b)(ii) of the *Electrical Power Control Act, 1994 ("EPCA")* requires that consumers in the province have equitable access to an adequate supply of power.

2 Overloading refers to utilizing equipment to a higher degree than designed or intended to be used. Overloading equipment can occur at the substation level, on equipment such as substation transformers, breakers and reclosers, or on specific sections of the distribution system.

3 See Request for Information CA-NP-100 for the response relating to the new substation proposed near the St. John's Airport.

4 The Company's distribution planning criteria align with the Distribution Planner's Manual published by the Canadian Electricity Association ("CEA") and consist of the following system constraint factors: (i) ampacity; (ii) short circuit capacity; (iii) voltage and power quality; and (iv) reliability.

5 In general, the alternatives for addressing an overload condition on a substation transformer involve the following: (i) transferring the customer load from 1 existing substation transformer to another; (ii) paralleling substation transformers together; (iii) replacing an existing substation transformer with a higher capacity substation transformer; (iv) installing an additional substation transformer; and (v) constructing a new substation.

6 See *2021 Capital Budget Application, Volume 2, report 2.2 2021 Additions Due to Load Growth, Attachment A – Dunville Load Growth Study*.

expected to experience a total peak load of 8.8 MVA. The existing transformer capacity at the DUN substation is 8.3 MVA. As a result, the load forecast indicates that the DUN substation will be overloaded in 2021.[7] Three alternatives were considered in the Dunville Study with the least-cost alternative being proposed in the *2021 Capital Budget Application.*[8]

Newfoundland Power's *Additions to Load Growth* project ensures the Company adequately addresses overload conditions on its electrical system. The consequences of not completing this work in 2021 are twofold. First, overload conditions can lead to in-service equipment failures, which can result in significant repair costs and extended customer outages. Second, overload conditions can practically limit the ability of Newfoundland Power to connect new customers to the distribution system in heavily loaded areas. The probability of these consequences occurring is high considering equipment will be expected to operate above rated capacity.

[7] Load growth at the DUN substation is primarily the result of new residential growth in the areas of Dunville and Southeast Placentia associated with economic development in the Long Harbour and Argentia areas. The electrical load supplied by the DUN substation has increased by 13% from 7.6 MVA to 8.6 MVA in the 10-year period from 2009 to 2018.

[8] The alternatives included: (i) installing a new 25 MVA transformer at the DUN substation; (ii) transferring load to the Clarke's Pond ("CLK") substation; and (iii) installing the spare 25 MVA transformer in the DUN substation. The least-cost alternative proposed is the installation of the spare 25 MVA transformer in the DUN substation.