Q. (Reference Application Schedule B, Distribution Feeder Automation, page 50 of 99) It is stated "*This Distribution project is necessary to increase automation in the Company's distribution system. Increased automation in the distribution system improves customer service through reduced restoration times following both local and system-wide outages*." On page 51 of 99 it is stated "*Distribution feeder automation is recognized in the electric utility industry as providing both reliability and efficiency benefits for customers*." Later on page 51 of 99 it is stated "*This project is justified on the obligation to provide reliable service to customers at least cost and cannot be deferred.*"

a) Please quantify the efficiency benefits to customers resulting from this project.
b) Please provide evidence based on reliability criteria that Newfoundland Power will be unable to provide reliable service at least cost if it were to delay this project.
c) Please quantify the impact on the following if the project were delayed by two years: 1) reliability, 2) cost, and 3) the risk and consequences of failure.
d) Please indicate when the Distribution Feeder Automation project began. What efficiency improvements have been made in the administration of the program and how much have these improvements decreased the costs of the program?

A. a) The *Distribution Feeder Automation* project involves the installation of downline reclosers. Downline reclosers are pole-mounted devices that essentially divide a distribution feeder into multiple sections. These devices are controlled remotely to: (i) isolate a fault so only a portion of customers on a feeder experience an outage, instead of all customers; and (ii) systematically restore power to customers following a prolonged outage.[1]

Downline reclosers provide efficiencies through their ability to be controlled without dispatching field crews. They also provide efficiencies in outage response as sections of line no longer need to be patrolled to identify the cause and location of outages.[2] Avoiding the need to dispatch field crews and decreasing patrol times reduces costs to customers.

These devices provide an efficiency and reliability benefit to customers during normal operations.[3] As examples, in May 2019, the operation of a downline recloser quickly restored service to 665 customers served by Chamberlains ("CHA")

[1] For example, customers served by Doyles ("DOY") Substation feeder DOY-01 experienced an outage in December 2020. A downline recloser was operated to mitigate issues associated with cold load pick-up. The operation of this downline recloser avoided an additional outage to over 1,000 customers served by that feeder.

[2] In Newfoundland Power's vast service territory, long drives to identify the cause of outages is not uncommon. Reducing the length of distribution feeder to be patrolled provides cost benefits. For example, the approximate overtime cost of a 2-person line crew is $220/hr; the approximate overtime cost of a technologist is $100/hr. So, for example, reducing the response time required to locate an outage at night using a line crew and a technologist by just 2 hours would yield savings of approximately $640 (($220 + $100) x 2 = $640) for a single routine outage call.

[3] "Normal operations" refer to external conditions that can reasonably be expected to occur in a utility's service territory.

Substation distribution feeder CHA-01 following an equipment failure. In April 2020, the operation of a downline recloser on Hardwoods ("HWD") Substation distribution feeder HWD-08 avoided over 96,000 customer outage minutes. In both cases, this reliability benefit was provided to customers without the requirement to dispatch field crews.

The efficiency and reliability benefits of downline reclosers are most pronounced during significant events.[4] For example, the operation of 5 downline reclosers during a severe blizzard in January 2020 avoided approximately 3.5 million customer outage minutes without the assistance of field crews.[5]

b) Newfoundland Power manages its capital expenditures in a manner that balances both the cost and reliability of the service provided to its customers.[6] The Company is focused on maintaining current levels of overall service reliability for its customers at the lowest possible cost.[7] The 2022 *Distribution Feeder Automation* project is consistent with this objective.

Newfoundland Power's criteria for the *Distribution Feeder Automation* project involves the installation of downline reclosers under 3 scenarios:

(i) Scenario 1 involves the installation of 1 downline recloser such that 2/3 of the customer load is located between the device and the substation. Priority is given to feeders that have the potential to result in a high number of customer outage minutes per interruption. These feeders can be characterized as being radially fed or heavily loaded and serving a large number of customers.[8]

(ii) Scenario 2 involves the installation of multiple downline reclosers such that 1/3 of the customer load is located between devices. The installation of multiple downline reclosers is an optimal solution for long rural feeders and heavily loaded urban feeders.[9]

(iii) Scenario 3 involves the the installation of downline reclosers at normally open tie locations. Normally open tie switches are automated in specialized cases only. To automate a tie point between 2 feeders, the following conditions must apply: (i) at least 1 of the feeders must have a downline recloser installed on it; (ii) the feeders must be of the same voltage; (iii) each feeder must have

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[4] "Significant events" refer to external events that exceed the design parameters or operational limits of the electrical system.
[5] See Newfoundland Power's *2022/2023 General Rate Application, Volume 1, Section 2 Customer Operations,* page 2-30.
[6] See response to Request for Information NLH-NP-042.
[7] See response to Request for Information CA-NP-014.
[8] See Newfoundland Power's *2020 Capital Budget Application, Report 4.5 Distribution Feeder Automation,* page 4.
[9] Ibid., page 5.

adequate capacity to support load from the adjacent feeder; and (iv) the substation transformer supplying each feeder must have adequate capacity.[10]

The 2022 *Distribution Feeder Automation* project involves the installation of 16 downline reclosers on 14 distribution feeders. These downline reclosers will allow the Company to maintain reliable service for customers without the assistance of field crews and will contribute to reduced time to identify the cause of outages.

The efficiency benefit provided by the 2022 *Distribution Feeder Automation* project is consistent with maintaining current levels of service reliability for customers at the lowest possible cost.

c) Delaying the *Distribution Feeder Automation* project by 2 years would mean that customers would not be provided with the efficiency and reliability benefits associated with installing downline reclosers, as described in parts a) and b).[11]

Delaying this project would therefore be inconsistent with maintaining reliable service for customers at the lowest possible cost.

d) Newfoundland Power commenced the large-scale installation of downline reclosers following widespread customer outages known as #darkNL and the subsequent investigation by the Board.[12]

The *Distribution Feeder Automation* project began in its current form in 2020. Newfoundland Power developed a strategy for the installation of downline reclosers as part of its *2020 Capital Budget Application*. This strategy provides a structured approach for the installation of downline reclosers following the scenarios outlined in part b). This strategy will ensure downline reclosers are installed in appropriate locations under the various scenarios. This is consistent with maximizing the associated efficiency and reliability benefits for customers.

The Company is in the early stages of implementing this strategy and refinements will be made over time, if required.

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[10] Ibid., page 6.

[11] For information on Newfoundland Power's approach to quantifying risks and benefits, see response to Request for Information CA-NP-014.

[12] Increasing the level of automation in the distribution system is consistent with Recommendation 2.4 of The Liberty Consulting Group's *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power*, December 17, 2014. In April 2014, Newfoundland Power filed as Supplemental Capital Budget Application to increase the automation of the electrical system, which was approved in Order No. P.U. 14 (2014).