

1 **Reference: 2024-2028 Capital Plan**

2
3 **Q. Page 4. Figure 1 shows that the average duration of outages, excluding major**
4 **events, has improved since 2004 with the average duration of outages being**
5 **less each year since then. To what does Newfoundland Power attribute the**
6 **improvement in its reliability performance over the period 2004 to present?**

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8 **A. A. General**

9
10 Newfoundland Power observes that the average duration of outages to Newfoundland
11 Power's customers, measured as SAIDI ("System Average Interruption Duration Index"),
12 has improved since 2004 and has remained relatively consistent over the period 2005 to
13 present.¹ During this period, the number of customers served by the Company
14 increased by 49,300, or 22%.²

15
16 Newfoundland Power's reliability performance over the 2004 to 2022 period is
17 attributable to a number of factors including: (i) design and construction standards;
18 (ii) asset management practices; and (iii) operational response.

19
20 **B. Design and Construction Standards**

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22 Reliability performance is principally a reflection of the general condition of the electrical
23 system. For that reason, the standards applied when designing and constructing the
24 electrical system significantly affect the reliability experienced by customers.

25
26 Newfoundland Power's transmission lines and distribution feeders are designed and
27 constructed to meet design standards at the time of construction. The principle design
28 standard for transmission and distribution line design in Canada is the *CSA Standard*
29 *C22.3 No. 1-15, Overhead Systems* (the "CSA Standard"). In 2001, the CSA Standard
30 loading criteria for the Avalon and Bonavista Peninsulas was updated from "Heavy" to
31 "Severe".³ A more robust design and construction criteria enables Newfoundland
32 Power's transmission and distribution system to better withstand the challenging
33 environmental conditions that can be experienced in the Company's service territory.

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35 **C. Asset Management**

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37 Newfoundland Power's asset management practices for its transmission, distribution,
38 and substation assets enables the Company to identify and correct equipment related
39 issues and prevent customer outages before they occur.

1 SAIDI is calculated by dividing the total number of customer outages minutes by the total number of customers served.

2 At December 31, 2004, Newfoundland Power had 224,464 customers. At December 31, 2022, Newfoundland Power had 273,764 customers. $(273,764 - 224,464) / 224,464 \times 100\% = 22.0\%$.

3 The CSA Standard recognizes four classifications of weather load conditions for ice accumulation, wind loading, and temperature. These are: (i) medium loading B; (ii) medium loading A; (iii) heavy; and (iv) severe. Newfoundland Power's service territory has heavy and severe loading classifications. Only two other provinces are identified as having severe weather loading areas. These are: (i) parts of northern and southern Manitoba; and (ii) rural parts of eastern Quebec, including the Gaspé Peninsula.

1 As examples of projects, programs and strategies that were implemented in late 1990s
 2 to mid-2000s that, over time, improved and helped maintain Newfoundland Power's
 3 overall reliability performance:

- 4
- 5 • In 1998, the *Distribution Reliability Initiative* capital project was introduced to
 6 target the replacement of deteriorated poles, conductor, and hardware to
 7 improve reliability for customers served by specific distribution feeders or
 8 sections thereof.
 - 9
 - 10 • In 2004, the *Rebuild Distribution Lines* program was introduced as a preventative
 11 maintenance program that involves the planned replacement of deteriorated
 12 distribution structures and electrical equipment identified through inspections or
 13 engineering reviews. The program is a cornerstone of the Company's overall
 14 distribution reliability management practices.
 - 15
 - 16 • In 2006, the *Transmission Line Rebuild Strategy* was introduced, which outlined
 17 a multi-year plan for rebuilding the Company's aging and deteriorated
 18 transmission lines.⁴
 - 19
 - 20 • In 2007, the *Substation Strategic Plan* was introduced to outline how substation
 21 capital projects were to be planned and executed in part to manage the
 22 Company's aging substation equipment.⁵
 - 23

24 The role of the Company's asset management practices in contributing to Newfoundland
 25 Power's reliability performance was recognized by the Board's consultant, the Liberty
 26 Consultant Group ("Liberty"), in 2014. In its report addressing Newfoundland Power,
 27 Liberty stated:

28
 29 *Newfoundland Power's reliability has improved significantly since 1999 and*
 30 *has recently remained stable overall. It's transmission and distribution*
 31 *systems operate effectively in ensuring adequate service reliability. Effective*
 32 *maintenance and capital programs, that appropriately recognize the age of*
 33 *its assets, have contributed materially to improved reliability.⁶*

34
 35 *Newfoundland Power's substation inspection, corrective maintenance, and*
 36 *preventative maintenance practices are consistent with good utility practices.*
 37 *Newfoundland Power's substation maintenance activities are an appropriate*
 38 *mix of time-based inspections and predictive and preventative maintenance*
 39 *activities, and of condition-based major preventative equipment*
 40 *maintenance/overhaul activities, based on inspections, oil tests and other*

⁴ See the response to Request for Information PUB-NP-041 for additional information on the *Transmission Line Rebuild Strategy*.

⁵ See the response to Request for Information PUB-NP-035 for additional information on the *Substation Strategic Plan*.

⁶ See Liberty, *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power*, December 17, 2014, page ES-2.

1 *non-intrusive tests, and operating issues, and by the Company's experience*
2 *with the equipment.*⁷

3
4 Continued execution of the Company's transmission, distribution, and substation asset
5 management practices contributes towards Newfoundland Power's consistent reliability
6 performance since 2004.

7 8 **D. Operational Response**

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10 Newfoundland Power's operational response has contributed to an improvement in
11 reliability and overall consistent level of reliability since 2004. This can largely be
12 attributed to advancements in technology. This includes: (i) the installation of
13 equipment that provide a level of electricity system automation; and (ii) the deployment
14 of technology that allows Newfoundland Power to respond to customer outages more
15 quickly.

16
17 The use of automation has improved the ability of Newfoundland Power to address
18 customer outages. This includes the automation of the substation feeder breakers and
19 reclosers. The benefits of automation of substation feeder breakers and reclosers was
20 described in the March 2001 study *Distribution Feeder Remote Control and*
21 *Relay/Recloser Replacement Review*. In the study, Newfoundland Power stated:

22
23 *By using the strategy to equip distribution feeders with electronic relays and*
24 *reclosers that will communicate with the System Control Centre (SCC) and*
25 *require little maintenance, Newfoundland Power can seize a significant*
26 *opportunity to improve safety, increase reliability levels, reduce*
27 *environmental risk, and lower operating costs. This strategy will provide*
28 *faster restoration of electrical supply to customers affected by feeder outages*
29 *and an opportunity to re-deploy technical and operational personnel to obtain*
30 *further gains in reliability and customer service.*⁸

31
32 By 2015, approximately 60% of Newfoundland Power's distribution feeders were
33 automated at the substation breaker or recloser. By 2019 all substation breakers and
34 reclosers were automated. Completing this work over the 2002-2022 period enabled
35 Newfoundland Power to achieve the reliability benefits envisioned in 2001. The
36 deployment of automated downline reclosers on distribution feeders provides similar
37 benefits during customer outages, particularly during major events.⁹

⁷ Ibid, page 51.

⁸ See *Distribution Feeder Remote Control and Relay/Recloser Replacement Review, March 2001* filed with the response to Request for Information PUB 9.3 of Newfoundland Power's *2002 Capital Budget Application*.

⁹ See Newfoundland Power's *2024 Capital Budget Application, Schedule B*, pages 15 to 19. Downline reclosers are pole-mounted devices that operate automatically to restore service to customers and can be controlled remotely by the System Control Center. Because downline reclosers are operated remotely, field crews can focus on restoring service to customers. Restoration efforts also become more efficient as the sectionalizing of feeders means portions no longer need to be patrolled to identify the cause and location of outages.

1 Newfoundland Power centralized the management of its field response in 2014 using its
2 Workforce Management System ("WFMS").¹⁰ A Central Dispatch team located in
3 St. John's is now responsible for scheduling, dispatching and monitoring the completion
4 of all field work throughout the Company's service territory, including the response to
5 customer outages.¹¹ In addition to the WFMS, Central Dispatch uses an integrated
6 Outage Management System ("OMS")¹², Geographic Information System ("GIS")¹³, and
7 Automatic Vehicle Location ("AVL")¹⁴ system to provide an efficient and effective
8 response to customer outages while serving an increased number of customers.¹⁵

9 10 **E. Conclusion**

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12 Newfoundland Power has been able to improve reliability since 2004 and maintain
13 consistent reliability levels since that time while serving increasing numbers of
14 customers. The Company has been able to achieve this by designing and constructing
15 its electricity system to the appropriate standards; executing its asset management
16 practices; and utilizing technology advancements that improve the efficiency of
17 Newfoundland Power's outage response.

¹⁰ See Newfoundland Power's *2022 Capital Budget Application*, report 7.3 *Workforce Management System Replacement* for information on Newfoundland Power's existing workforce management system.

¹¹ Prior to implementing Central Dispatch, these functions were completed separately for each of Newfoundland Power's eight area offices.

¹² The adoption of the current OMS was supported by the Board's consultant, Liberty, in its 2014 assessment of Newfoundland Power. See Liberty, *Report on Island Interconnected System to Interconnection with Muskrat Falls addressing Newfoundland Power*, December 17, 2014, Page 73.

¹³ The GIS contains the location of Newfoundland Power's electrical system equipment throughout its service territory.

¹⁴ The AVL provides real-time information regarding the location of Newfoundland Power's field resources.

¹⁵ When an outage is reported, the integrated Central Dispatch system completes an automated outage assessment, dispatches the appropriate field staff to the assessed location, and completes coordinated customer communications.