

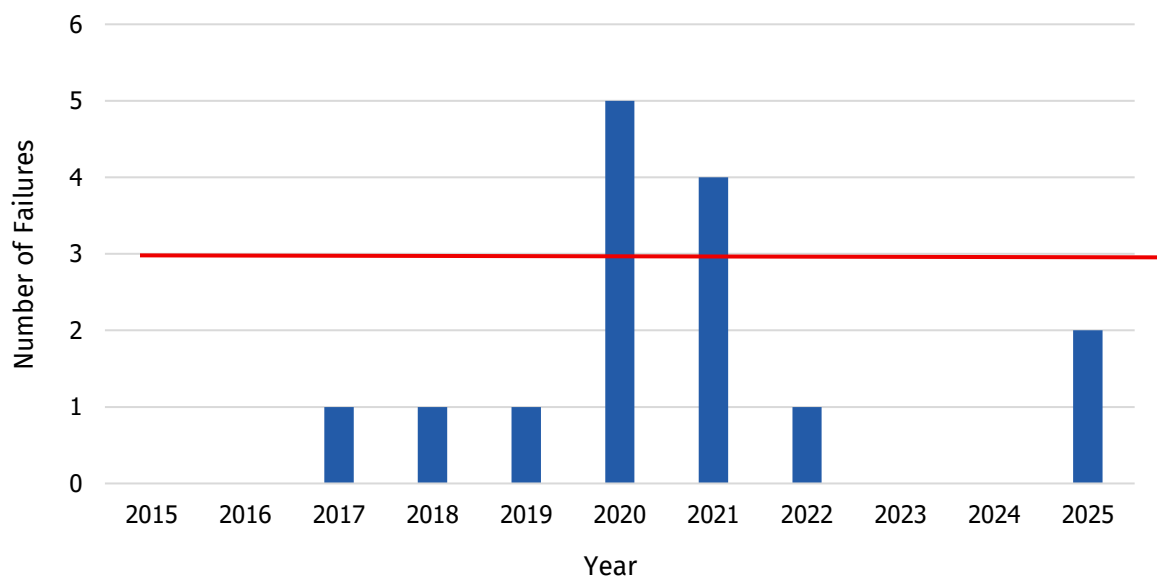
Q. Reference: Newfoundland Power's 2027 Capital Budget Application, 2.2 Substation Power Transformer Strategy

Provide the historical annual in-service power transformer failure rate for each transformer proposed for replacement, for the period 2015 to 2025, and compare it with the forecast failure rates used to support the Power Transformer Strategy and Portable Substation projects.

A. The power transformers proposed for replacement in Newfoundland Power's *2027 Capital Budget Application*, LAU-T1, LBK-T1, HAR-T1, and RRD-T3, have not experienced failures of major transformer components during the period of 2015 to 2025. While these transformers have experienced outages as identified in the response to Request for Information CA-NP-044, part b), these outages were associated with auxiliary transformer components or external factors rather than failures of major transformer components. Although the transformers requiring replacement have not experienced major component failures during the 2015 to 2025 period, condition assessments indicate increasing deterioration and probability of failure.

Figure 1 shows the number of power transformer failures experienced across Newfoundland Power's power transformer fleet from 2015 to 2025. The red line on Figure 1 reflects the forecast replacement rate assumption of approximately three power transformers per year used in Newfoundland Power's Substation Power Transformer Strategy.

**Figure 1
Power Transformer Failures
(2015-2025)**



1 Power transformer failures have been sporadic over the past ten years, ranging from
2 zero failures in a year to as many as five failures in a single year. This variability
3 demonstrates the challenges associated with predicting individual transformer failures
4 and highlights the importance of maintaining adequate emergency response resources
5 to respond during periods of elevated failure activity.

6
7 The *Substation Power Transformer Strategy* and *Portable Substation* project are not
8 designed to forecast or respond to specific transformer failures. Rather, they are
9 designed to manage and mitigate the risks associated with Newfoundland Power's aging
10 power transformer fleet as a whole. As discussed in the Substation Power Transformer
11 Strategy, transformer failure risk increases with age as transformer condition
12 deteriorates. The Gannett Fleming Service Life Study forecasted 107 transformer
13 retirements over the period of 2023 to 2052 and indicated that Newfoundland Power
14 should expect to replace, on average, approximately three transformers annually.¹ The
15 forecast planning assumption of approximately three power transformer failures or
16 replacements annually is intended to support long-term fleet management and
17 emergency response planning rather than serve as a prediction of specific transformer
18 failures.

19
20 Newfoundland Power's Substation Power Transformer Strategy utilizes Gannett
21 Fleming's statistical forecasting by combining it with actual asset condition and risk
22 assessments. Actual replacement decisions are based on transformer condition, age,
23 maintenance history, and risk assessments rather than historical failures or pure
24 statistical predictions. The overall approach of the Substation Power Transformer
25 Strategy therefore ensures that no substation power transformer is replaced before it
26 has actually reached the end of its useful service life.²

27
28 As Newfoundland Power's transformer fleet continues to age, without intervention, the
29 Company expects the risk of transformer failures to increase over time. Portable
30 substation capacity and spare transformer inventory must be sufficient to address
31 periods when multiple failures occur within a relatively short time frame, rather than
32 being based solely on average historical failure experience.

¹ See the *2026 Capital Budget Application*, report 2.2 *Substation Power Transformer Strategy*, Appendix C, pages IV-2 - V-2.

² See the response to Request for Information PUB-NP-008.