

1 **Reference: 3.1 2024 Transmission Line Rebuild**

2
3 **Q. Page 8. How did Newfoundland Power determine that the probability of**
4 **failure for Transmission Line 146L had increased to the extent it is required to**
5 **be rebuilt at this time rather than being deferred to a future year? Include in**
6 **the response how Newfoundland Power quantified the increase in the**
7 **probability of failure.**

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9 A. Newfoundland Power relies on engineering judgment to perform risk assessments and
10 uses its risk matrix methodology to provide reasonable consistency and transparency in
11 its communication of the risk associated with the capital projects and programs included
12 in its *2024 Capital Budget Application*.¹ While the Company continues to rely on its
13 familiarity and operational experience with its assets, to inform its capital planning
14 process, the risk matrix methodology relies on a combination of quantifiable factors and
15 engineering judgement in the Company's evaluation of risk.

16
17 In determining probability values, Newfoundland Power's risk matrix methodology relies
18 primarily on engineering judgement but employs quantitative probability values to
19 demonstrate the likelihood that a consequence will occur. Probability values range from
20 Rare (1), meaning the probability of a consequence occurring is 10% or less, to Near
21 Certain (5), meaning the probability of a consequence occurring is 91% or higher. For
22 expenditures involving the refurbishment or replacement of existing plant, the
23 probability value is determined primarily based on asset condition. Other considerations
24 include previous operating experience and whether an asset has exceeded its expected
25 useful life.

26
27 Transmission Line 146L is a 138 kV line running between Gander and Gambo
28 substations, and is part of the Central Newfoundland 138 kV looped transmission
29 system. The line is 40.7 kilometres in length and was originally built in 1964. It consists
30 of approximately 160 H-Frame structures and has been in service for almost 60 years.
31 Transmission Line 146L does not meet current standards established by the Canadian
32 Standards Association, meaning it is not built to withstand local climatic conditions,
33 putting it at an increased probability of failure.

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35 Transmission Line 146L has been inspected annually over the last decade. Annual
36 inspections are conducted by experienced Planners following the Company's
37 *Transmission Line Inspection and Maintenance Practices*. The Company monitors these
38 work requests to inform its future capital investment priorities. Over the last 10 years
39 the number of work requests created following annual inspections of Transmission Line
40 146L have increased significantly, nearly doubling each year from 2019 to 2023, with
41 the most recent inspection identifying 156 work requests. The increase in the
42 deficiencies identified each year is indicative of the continued deterioration of this
43 transmission line.
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¹ For the risk matrix methodology, see Newfoundland Power's *2024 Capital Budget Application, 2024 Capital Budget Overview*, Appendix C.

1 In response to the increase in the deficiencies identified each year, Newfoundland Power
2 completed an engineering assessment of the line. This assessment found that a total of
3 104 of 160 H-Frame structures on the line have deficiencies present, with 94 structures
4 containing deteriorated poles. In total, 192 poles on Transmission Line 146L require
5 replacement. The deteriorated condition of these poles is to be expected given they
6 have exceeded the expected useful service life of a transmission line wood pole.²
7
8 Based on the line's sub-standard design, the increase in the number of deficiencies
9 present, and its overall deteriorated condition, Newfoundland Power assigned a
10 probability value of Likely (4) meaning, if the project does not proceed, the probability
11 of failure is judged to be within a range of 76% to 90%.

² Transmission Line 146L has been in service for 59 years. Industry experience indicates the expected useful service life of a transmission wooden support structure is 58 years. See Newfoundland Power's *2024 Capital Budget Application, 2024-2028 Capital Plan*, page 10.