Q. (Reference 3.1 - Transmission Line 100L Rebuild) It is stated (page 10) "*This means that any single failure on Transmission Line 109L or Transmission Line 124L could result in an outage to approximately 16,000 customers*."
a) Is this a design criterion used by NP when planning its transmission system and does it equate to an n-2 criterion?
b) Please provide a list of NP' s transmission lines that would not result in radial feeds when an outage occurs.
c) Has there ever been failures on Line 109L or Line 124L when Line 100L has been out of service? If so, when?

A. a) This scenario does not equate to an N-2 criterion. A transmission system that satisfies an N-2 criterion would be able to withstand an outage to two transmission lines. In the case of the transmission system comprising 100L, 109L and 124L, an outage to any two of these lines will result in widespread outages. Consequently, the system does not satisfy an N-2 criterion.

Newfoundland Power operates a variety of looped and radial transmission systems with differing levels of redundancy. The presence of both looped and radial systems is largely a result of the original interconnection of the Newfoundland electricity system and is driven by the geographical proximity of infeed supply points to the bulk power system. During the evaluation of potential transmission line upgrades, condition and risk assessments are conducted to inform potential reliability impacts. Typically, if evaluated alternatives have similar costs, the more reliable option will be pursued.

b) Newfoundland Power's transmission lines facilitate power flow from Newfoundland & Labrador Hydro's ("Hydro") bulk transmission network to large systems of customers. The Company operates numerous 66kV and 138kV looped transmission networks that consist of multiple interconnected substations, some of which have three or more transmission line interconnections. These larger substations often serve as centralized hubs for power flow that are also important for additional customers served by other substations, rather than just supplying their own specific distribution feeders.

Table 1 on the following page shows a list of Newfoundland Power's larger substations having three or more transmission interconnections, as well as any associated transmission lines that, when disconnected, do not result in radial transmission arrangements. These are generally located in densely populated areas, such as the St. John's and surrounding areas.

Table 1
Transmission Lines Connected to Larger Substations That Do Not Result in Radial Configurations When Disconnected[1]

Substations	Transmission Lines
Bishop Falls, Stony Brook	133L
Blaketown, Bay Robert's	86L, 64L
Bay Robert's, Carbonear	56L
Chamberlains, Hardwoods	49L, 79L
Clarenville, Sunnyside	100L
Goulds, Hardwoods	72L
Goulds, St. John's Main	4L, 25L
Kenmount Road, Stamp's Lane	69L
Kenmount Road, Hardwoods	54L
Oxen Pond, Virginia Waters	34L, 58L
Oxen Pond, Ridge Road	32L, 67L
Ridge Road, King's Bridge Road	30L
Stamp's Lane, St. John's Main	13L

Newfoundland Power conducts transmission contingency analyses of its 138kV and 66kV transmission lines as part of Hydro's annual transmission assessments. The results of disconnecting each of the lines above are considered as part of the assessments.[2] It should be noted that while no radial networks result from disconnecting the transmission lines above, the remaining connections, while not technically radial, may be subject to customer outages if other transmission outages were to occur. Specifically, the resulting arrangements may still be subject to voltage or overload conditions, depending on the contingency scenario and the system peak. Newfoundland Power does not conduct N-2 analyses.

[1] Hydro also operates numerous looped transmission systems that supply both Hydro terminal stations and Newfoundland Power substations with three or more connections. In such cases, a loss of any transmission line would not result in a radial configuration. These include numerous transmission lines supplying the following terminal stations and/or substations: Deer Lake, Massey Drive, Bottom Brook, Buchans, Western Avalon, Holyrood, and Soldier's Pond

[2] See report filed by Hydro, *NLSO Report – 2025 Annual Planning Assessment.*

c) There has never been a failure on 109L or 124L while 100L has been out of service.

Reliability indices, such as the number of outages experienced by a transmission line, are lagging indicators that encompass historical issues on the electrical system. Waiting for reliability on the transmission system to degrade before undertaking capital investments would result in a poor quality of service being experienced by large numbers of customers for several years. Newfoundland Power relies on an assessment of a transmission line's condition and its criticality in serving customers when determining whether a transmission line should be rebuilt.