Substations

Q. Reference: "2024 Capital Budget Application," Newfoundland Power Inc., June 22, 2023, Supporting Materials, Substations: 2.1, app. D, p. 1.

> **ISL-T1 is the Company's second oldest distribution power transformer and is approaching the end of its useful service life.**

Does Newfoundland Power have oil samples and maintenance reports to show that this transformer is at end-of-life? If yes, please provide this data. If not, why not?

A. Newfoundland Power does not have oil samples and maintenance reports that show power transformer ISL-T1 has reached end-of-life.

Power transformer ISL-T1 is a 65-year-old distribution power transformer manufactured by English Electric in 1958. Transformer ISL-T1 is the Company's second oldest distribution power transformer and is *approaching* the end of its useful service life.[1] The risk of this power transformer failing is expected to increase as it continues to age.[2] It is proposed that power transformer ISL-T1 be replaced due to the limited remaining expected life, the risk of an extended outage in the event of a failure, and the long lead times associated with procuring new power transformers.

Newfoundland Power evaluated two alternatives to address the deteriorated condition of power transformer ISL-T1 which would mitigate risks to the delivery of reliable service to customers. These alternatives were: (i) complete the *Islington Substation Refurbishment and Modernization* project using the existing power transformer, including a refurbishment of the existing power transformer; or (ii) purchase and install a new transformer in 2025 during the *Islington Substation Refurbishment and Modernization* project. An analysis of alternatives determined that procuring and installing a new power transformer to replace the existing ISL-T1 is the least cost alternative. For additional information on the analysis of alternatives, see the response to Request for Information PUB-NP-037.

[1] According to industry experience, the expected life of a power transformer is between 30 and 50 years, with a sharp decline for in-service power transformers past 70 years of age according to the International Council on Large Electric Systems *Asset Management Decision Making Using Different Risk Assessment Methodologies* 2013 report on asset management.

[2] Insulation deterioration of the power transformer internal windings naturally occurs over time and is accelerated with exposure to high temperatures. Degraded insulation is a major indicator that a power transformer has reached end of life.