

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

Newfoundland Power is proposing the replacement of four transformers.

- a) Have these four transformers been selected based on age only?**
- b) For LAU-T1, LBK-T1 and RRD-T3, Newfoundland Power states that the Normal Degradation Index values are below the 0.6 threshold. Does this indicate that these transformers have useful service life remaining?**
- c) Identify the threshold of Normal Degradation Index values that Newfoundland Power uses to determine when a transformer should be monitored, repaired, refurbished, or replaced. Explain why LBK-T1 is proposed for replacement, given that the degradation results indicate 0.29, which remains far below the 0.6 threshold.**

- A.**
- a) No, these four transformers have not been selected based on age only. Refer to the response to Request for Information PUB-NP-009, part b) for additional information specific to each transformer.
 - b) No, a Normal Degradation Index below 0.6 does not necessarily indicate that a transformer has sufficient useful service life remaining to justify deferring replacement. The Normal Degradation Index is one indicator used to assess the condition of a transformer's paper insulation system and is considered alongside other information including abnormal condition indices, oil analysis results, physical condition assessments, maintenance history, operating experience, asset age, reliability risk, and the practicality and economics of continued maintenance and repair. Newfoundland Power's replacement decisions are based on a comprehensive assessment of asset condition and risk rather than any single test result or threshold.
 - c) Newfoundland Power does not utilize prescribed Normal Degradation Index thresholds to determine when a transformer should be repaired, refurbished or replaced. Rather, the Normal Degradation Index is one input used as part of a broader condition assessment process. As indicated by Electric Power Research Institute's ("EPRI") Power Transformer Expert System ("PTX"), a Normal Degradation Index greater than 0.25 indicates a unit that warrants further scrutiny. Normal Degradation Index values above 0.60 highly correlate with units that have insulating paper that is no longer capable of providing reliable service. Decisions regarding monitoring, repair, refurbishment, or replacement are based on the overall condition of the transformer, including oil analysis results, abnormal condition indices, physical condition assessments, operating experience, maintenance history, age, reliability risk, and economic considerations.

LBK-T1 is proposed for replacement because significant condition concerns exist beyond the paper insulation system represented by the Normal Degradation

1 Index. As described in PUB-NP-009 part b), condition assessments identified
2 deterioration affecting multiple major transformer components including
3 corrosion of the radiators, corrosion of the transformer tank, deterioration of the
4 sealing system, evidence of oil leakage and damage to transformer bushings.
5 Given the age of the unit, the extent of deterioration, and the limited long-term
6 benefit associated with future repairs, replacement was recommended over
7 repair.