

1 Q. **Reference: Failure Investigation Report – L3501/2 Tower and Conductor Damage, Icing Event**
2 **January 2021 in Labrador, Nalcor Energy, May 28, 2021, Appendix C – Conductor Failures -**
3 **LITL, EFLA, April 14, 2021, EFLA, April 13, 2021, page 17/20**

4 A very low unbalanced load of 4 kg/m can cause the electrode insulator glass
5 disk to rub against the electrode conductor and damage the strands. The
6 loading required is well within the design loads of 10 kg/m. Nalcor must
7 investigate the possibility of increasing the distance between the conductor
8 clamp and the insulator closest to the conductor so that the string can
9 accommodate greater longitudinal swing than 55 degrees and not damage the
10 conductor.

- 11 a) Please confirm whether Hydro intends to accept this recommendation.
- 12 b) Does the unbalanced ice study scheduled to be completed on June 30, 2021 include analysis
13 of conductor swing under unbalanced ice loads in order to avoid insulator contact with the
14 conductor. If not, why not?

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17 A. To clarify, it was determined that for certain structures, an unbalanced ice load with a difference
18 of 4.5 kg/m is required to cause the electrode insulator assembly to swing to the extent it will
19 contact the conductor. The Labrador-Island Link was designed for an unbalanced ice load with a
20 difference of 2.1 kg/m. The larger difference in ice load was outside the parameters of the
21 original design loading and insulator assembly design. This condition is not thought to have
22 contributed to the failure of the conductor. A small dent in the conductor will not significantly
23 decrease the conductor's tensile strength. Because it is not a critical issue, there are no plans to
24 modify the insulator assembly to avoid this condition. The unbalanced ice study is focused on
25 the overall tower structural loading and does not include an analysis of hardware clearance
26 under unbalanced conditions that could result in insulator contacts. Furthermore, this contact is
27 not expected to damage the conductor to an extent that would impact operation.