Q. **Re: Labrador Expansion Study, pages 220 and 223 (pdf); 2018 CBA, MFHVI Project, Revision 2, dated January 25, 2018, p. 34 of the pdf**

Citation 1 (p. 220):

Based on the current projection (solid red curve), the data used in this analysis indicates that the expected mean life for the L1301/L1302 wood pole plant asset is approximately 103 years (Figure 1), which is significantly higher than the conventional economic life of 40 years historically used in the industry. The typical Iowa curve assumes an expected asset life of 50 years. Similarly, the expected mean life for the X-arm shows that the asset life is 63 years (Figure 2).

Citation 2 (p. 223):

6 Recommendations for Replacement Rate and Initial Costs

Based on the asset life data analysis, it is estimated from Figure 3 that the replacement rate of the pole plant asset for L1301 for the next 20-year planning horizon would be 0.30 percent per year given that it has survived for 42 years of operation. Similarly, this replacement rate for the X-arm asset would be 2.3 percent per year (Figure 4).

7 Summary and Conclusions

Results of the data analysis clearly demonstrate that the expected life of the wood pole for L1301 is estimated as 103 years while the X-arm is estimated as 63 years. The line has survived 42 years of operations. The overall pole replacement rate per year is well below the published industry data. Based on the current rejection rate, it is estimated that Hydro may be required to replace 0.30 percent of pole plant asset per year for the planning horizon considered in this study. For the X-arm, this replacement rate would be 2.3 percent per year. Planned maintenance outage duration for L1301 is estimated to be seven days in each year of future operation to support this replacement rate and the number of poles and X-arms that need to be

replaced per year. The planned maintenance outage duration should be pro-rated for L1302 in terms of line length.

Given these results, and assuming that the proposed maintenance program is followed, is there any reason to believe that there is a substantial risk of a prolonged forced outage on L1301/L1302? Please explain your answer.

A. Short-term outages due to failure of an individual component under normal loading conditions are possible on TL1301/TL1302. Standard inspection and maintenance programs are intended to detect and remove deteriorated, structurally inadequate equipment and, in general, extend the life of these lines. The reduced phase spacing on a large portion of TL1301 does not allow for standard inspections as crews are unable to climb the structures between the phases while still maintaining safe limits of approach. This causes a higher potential of missing a defect during regular inspections and increasing the risk of a prolonged forced outage.

In addition, prolonged forced outages (i.e., several days to weeks) are commonly caused by the failure of multiple structures due to the structural overload beyond the structure's design capability, typically caused by meteorological events. The probability of such a meteorological event is independent of maintenance inspections or the condition of the wood pole structures.

Newfoundland and Labrador Hydro will continue to perform maintenance on these lines to minimize the risk of outages until they are no longer required for service.