Q: Reference: ***Review of Newfoundland and Labrador Hydro Power Supply Adequacy*** **18** ***and Reliability Prior to and Post Muskrat Falls Final Report, August 19, 2016,*** **19** ***Page 77, Conclusion IV-17, Point 2***

For Conclusion IV-17, Point 2, bullets a, b, c and e, please indicate Liberty's estimation of the duration for these "relatively short duration" outages and the probability per year of their occurrence.

A. Conclusion IV-17, Point 2, bullets a), b) and c): Tripping of ac lines leading to a converter station can be caused by lightning strikes, pollution flashover or a tower collapse, e.g. due to severe weather. Lightning strikes may result in a short outage only, and may not impact on the HVdc transmission. Pollution may result in so frequent flashovers, that continued operation may not be advisable, because mechanical damage could be caused to insulators. The worst scenario will be the collapse of several towers. Hydro has stated that they will target to repair any line outage within 2 weeks, but if the weather is very severe, both HVdc and HVac towers might need to be repaired, which will stretch resources. Liberty does not have sufficient information to estimate the probability of such occurrences.

Conclusion IV-17, Point 2, bullet e): Operator errors are minimized by continuous and on-going training of Operators. Nevertheless, errors may happen, and the station may be tripped. Equipment damage, as a cause of operator error is usually unlikely, because the converter station protection will act. Therefore, the scheme can be returned to service following an investigation of the cause, and the usual safety checks. This will typically take at least 15 minutes. With good and continuous Operator training scheme the probability of outages being caused by Operator errors will be very small.