Q. Reference: *Probabilistic Based Transmission Reliability Summary Report*, Appendix A, Page 25 of 56, Table 10.

Please update Table 10, as set out below, to include the N-2 contingency reliability statistics for a Labrador Island Link bipole outage.

Table 10 – Double (N-2) Contingency Reliability Statistics for Post-HVDC Case

Contingency	***Failure Rate (outages per year)***	***Average Outage Duration (hours)***
TL265-TL268	*8.387E-06*	*2.392*
TL218-TL236	*2.569E-05*	*2.392*
TL242-TL266	*1.639E-05*	*2.392*
TL265-Holyrood CT	*5.366E-03*	*3.885*
LIL Bipole Outage		

A. Failure rate for the complete bipole system is provided in Section 5.2.1.5 of the report. The table may therefore be updated as follows:

Table 10 – Double (N-2) Contingency Reliability Statistics for Post-HVDC Case

Contingency	***Failure Rate (outages per year)***	***Average Outage Duration (hours)***
TL265-TL268	*8.387E-06*	*2.392*
TL218-TL236	*2.569E-05*	*2.392*
TL242-TL266	*1.639E-05*	*2.392*
TL265-Holyrood CT	*5.366E-03*	*3.885*
LIL Bipole Outage	*7.078E-01*	*13.49*

It should be noted that the table presented above does not provide an equivalent comparison of double contingencies. The failure rates presented for the ac system components represent coinciding independent events, while HVdc bipole outage rate includes estimated common mode failures from the SNC-Lavlin Study.

Common mode failures would increase the outage frequency rate for the 230 kV transmission lines referenced. Sources of common mode failures for these lines would relate to their common transmission right-of-way and common terminal station equipment. To understand the impact to these common mode failures would require a detailed analysis of terminal station configurations and terminal station equipment failures which was beyond the scope of the Teshmont Study. Teshmont similarly were not asked to do that type of analysis for the HVdc systems but instead used the previous work of SNC Lavlin.

For the purposes of this investigation, a more apt comparison would therefore involve the independent failure of two ac transmission lines with the independent failure of the overhead lines for two Labrador Island Link poles for a common length. The revised table is provided below.

Revised Table 10 – Double (N-2) Contingency Reliability Statistics for Post-HVDC Case

Contingency	***Failure Rate (outages per year per 100 km)***	***Average Outage Duration (hours)***
Independent failure of two ac Transmission Lines	*6.654E-04*	*2.39*
Independent failure of two HVdc Overhead Lines	*1.482E-05*	*0.89*

It is noted that the rate of coinciding independent failures for the overhead lines for two Labrador Island Link poles over the full 1100 km length is 1.792E-03.