Q. Reference: *Probabilistic Based Transmission Reliability Summary Report*, Appendix A, Page 29 of 56.
The failure rates and repair times for a bipole failure as provided in Section 5.2.1.5 of the Teshmont Report and in the response to Request for Information GRK-NLH-068 are similar in magnitude to the failure rates and repair times for Hydro's 230 kV lines provided in Table 7 of the Teshmont Report. Has Hydro given any consideration to whether the need or requirement for back-up capacity available in the event of bipole failure is similar to that of a failure of a 230 kV transmission line? In the response, please provide information on any consideration given to having additional back-up generation on the island to provide reliable capacity during peak period in the event of a bipole outage.

A. Hydro does not expect that a bipole failure rate will be similar to that of a 230 kV transmission line on the IIS. The SNC analysis relied on by Teshmont for their comparative probabilistic analysis was based on average industry experience of pole failures and an assumed bipole failure rate of one tenth of the pole failure rate.

A more accurate assessment of bipole reliability for the Labrador Island Link would involve consideration of the the limited factors and remote probabilities associated with the common mode failure of both poles due to the specific design aspects of that particular system.

For a bipole failure to occur on the Labrador Island Link, exposures are limited to two causes: the failure of equipment on a converter station neutral bus or a structural transmission failure.

With respect to converter station failure rates, a value of 0.1 failures per year per bipole should be applied, in accordance with Hydro's response to GRK-NLH-060 Revision 1. This reduced failure rate is based on the specification of the Labrador Island Link and provides a more accurate projection of converter station reliability. This is particularly the case as compared to existing systems with older converter station designs that may have more sources of common mode failure.

With respect to the structural failure of the transmission line, values of 0.002 per year should be applied for sections of the Labrador Island Link on the Avalon Peninsula and 0.00667 per year should be applied for other sections, as discussed in Hydro's response to PUB-NLH-133.

On this basis, the rate of bipole failures should occur at a rate of less than 0.11 per year, as opposed to a value of 0.78 per year.

It is noted that the bipole failure rate used in the Teshmont study was appropriate for the purposes of the investigation. The study demonstrated that the HVdc interconnections would provide a substantial reliability improvement over the existing system, even with a bipole failure rate that does not include consideration of the specific design aspects of the Labrador Island Link.

With respect to the addition of back-up generation capacity, as outlined in Hydro's response to PUB-NLH-542 Hydro has not yet completed its review of the generation capacity planning criteria to be applied following the interconnections via the ML and LIL. Furthermore, in the near term, if a bipole failure was treated the same as a single transmission line forced outage there is sufficient capacity in the system to meet customer demand following the loss of the Labrador Island Link during peak

load conditions. As per Hydro's response to PUB-NLH-542, this will be the case until 2024.