Q. At page 39 of the Appendix C9 SNC Lavalin report, SNC Lavalin states that *"In summary, during most of the year, the* loss *of the largest generator on the system (usually Bay d'Espoir #7) will require a reduction in the export on the Maritime link."* Will this remain the case if the proposed transmission line project is completed? If no, explain how such reductions will be mitigated by the new transmission line.

A. Appendix C9 is the April 2012 Load Flow and Short Circuit Study completed by SNC-Lavalin. The base cases were developed to "stress" the Island Interconnected System under various load conditions from winter peak to summer night with maximum and minimum values for island generation ("the island load range"), Labrador – Island HVdc LINK (LIL) imports and Maritime Link (ML) exports. The steady state analysis demonstrates that with LIL at maximum import for example, and generators off line on the island, loss of Bay d'Espoir Unit 7 will require reduction of the ML export to supply the island load as there will be insufficient generation on the island system to supply the island load. The loss of largest generator on the island contingency demonstrates the requirement to have sufficient generation reserves available to the island system if under frequency load shedding is to be avoided once LIL is in service.

Appendix C10 provides the March 2012 Stabilities Studies completed by SNC-Lavalin using the same base cases as per Appendix C9 (the load flow and short circuit studies). Page 6 of C10 provides the study criteria which include:

- *Load shedding should not occur for loss of the largest generator in Newfoundland,*

- *Load shedding should not occur for the temporary loss of a pole or bipole of an HVdc link,*

Further, the stability study assumes that should there be limited spinning reserve on the island, any event that results in a frequency depression on the island system would result in reducing the export to Nova Scotia over the Maritime Link (page 7 Appendix C10).

The SNC-Lavalin stability analysis results demonstrate that, for the temporary loss of a pole or bipole on the LIL, load reduction on the ML results in acceptable Island Interconnected System frequency with no under frequency load shedding on the island across the island load range from winter peak to summer night. The analysis also demonstrates that the ML load reduction provides acceptable island frequency response for loss of the largest island generator (contingency ST09) with no island under frequency load shedding across the island load range.

System integration studies completed by TransGrid Solutions (TGS) are provided in Appendix C with C2 providing a copy of DC1020 – HVdc System Integration Study Volume 1 – Summary Report. Section 5 of this report provides a summary of the transient stability analysis. On page 5-13 the analysis concludes:

"The need for under-frequency load shedding in the Newfoundland ac system is minimized. The HVdc system, due to its inherent controllability, provides an effective means of fast and efficient frequency control within the Newfoundland ac system by modulation of the HVdc power transfer to overcome capacity deficit or surplus situations. A number of simulations were carried out to show the effectiveness of such control to maintain system stability.

Figure 3 shows the effectiveness of the HVdc frequency control at maintaining the Island frequency for the loss of the single largest generator on the Island of Newfoundland (Bay d'Espoir Unit #7). As seen in Figure 3 the Island frequency recovers to 1.0 pu following loss of the largest single generator on the Island when the frequency control is active, whereas, without the frequency control, the frequency decays, and under-frequency load shed would be required on the Island to Avoid eventual frequency collapse."

The issue is one of system frequency response for loss of the largest island generator with the LIL in service. The analyses demonstrate that with an active frequency controller on the LIL converter station at Soldiers Pond and sufficient generation reserve shared between the island and the LIL, loss of the largest island generator will not result in the need for under frequency load shedding on the island or runback of the ML. The LIL is being designed to include a frequency controller such that under frequency load shedding will not occur for loss of generation on the island with the LIL in service.

Curtailment or runback of the ML will not occur for loss of the largest generator on the island. However, curtailment of the ML will occur for single pole and bipole faults on the LIL in order to maintain Island Interconnected System stability.

The proposed Bay d'Espoir to Western Avalon transmission line will have no significant impact on the frequency control mitigation techniques. The new line is required to assist in angular stability following multi-phase faults on the 230 kV transmission system.