Q. In discussions with Nalcor, it has been determined that the current design load for the HVDC overland transmission line is the 1-in-50 year return period, the standard design criteria for 230 kV transmission lines on the Island. Given the critical importance of the HVDC line, what consideration, if any, has been given to designing it to a higher standard? If no consideration has been given, why not?

A. The design standard for new 230 kV transmission lines on the Island portion of the Province is a 1-in-50 year return period. The basis of design for the overland portion of the HVdc transmission line between Labrador and the Island has its design standard set at the same 1-in-50 year return period.

Given that the HVdc line will deliver upwards of 800 MW to the Island Interconnected System, consideration has always been given to the reliability of the HVdc line.

Nalcor's transmission planning criteria for the integration of the Labrador – Island HVdc Link require that the Island Interconnected System recover from a temporary or permanent loss of a single pole and temporary loss of the bipole (i.e. pole to pole fault) with no loss of load. While Nalcor is not currently a member of any reliability organization as a transmission owner/operator, the planning criteria applied are consistent with the North American Electric Reliability Corporation (NERC) transmission planning standards and specifically TPL-001.0.1 System Performance Under Normal Conditions, Table 1. Transmission System Standards – Normal and Emergency Conditions, Category B, event 4. For the event involving loss of one pole of the bipole system, the 2 p.u., 10 minute rating of the healthy pole ensures no loss of load on the Island for the event.

For permanent loss of the bipole, NERC TPL-001.0.1 Table 1 under category C event 4 permits planned/controlled loss of load for the event. In the case of the Labrador – Island HVdc Link the permanent loss of the bipole is recognized as a substantial but infrequent event. In the spirit of the NERC criteria, Nalcor has accepted load loss for the permanent bipole outage. To prevent an entire Island Interconnected System outage for permanent loss of the bipole a special protection scheme (SPS) is contemplated to isolate the Avalon Peninsula loads during the event, thereby leaving central and western Island loads connected to central and western Island generation. This would prevent an island wide outage and would thus permit shorter restoration times. Sensitivity analysis completed under DC1210 indicates that cross tripping and/or over frequency protection may be required for such an SPS. As part of the integration studies being completed in final design the proposed SPS will be further refined.

Nalcor's reliability analysis also considers the contribution to reliability that would be made by the Maritime Link, the proposed HVdc transmission system between Newfoundland and Nova Scotia.

This system will have a rated capacity of 500 MW and will have the capability for bi-directional flow. For permanent loss of the entire Labrador – Island Link, power will be imported from the Maritimes via the Maritime Link and sufficient combustion turbine generation started on the Island to supply the Island load. With two independent, geographically separated HVdc lines to the Island, a design load based upon a 1-in-50 year return period for each HVdc line is deemed to provide an acceptable level of reliability to the Island transmission system.