Q. Re: **Upgrade Transmission Line Corridor** *Bay d'Espoir to Western Avalon*, Page 35. Please provide a comparison of transient stability before (i.e., in the current system configuration) and after the addition of the Labrador-Island HVdc Link (i.e., prior to the proposed 230 kV transmission line). In your response, please indicate the sources of potential instability which Hydro assesses as significant.

A. When comparing the transient stability of the existing system with the transient stability of the system after the addition of the Labrador-Island HVdc Link, one must consider the impacts of replacing active power generation at the Holyrood Thermal Generating Station with the supply from an HVdc converter station at Soldiers Pond. With this replacement, the system is fundamentally changed in its response to faults.

As discussed in Hydro's response to IC-NLH-006, a critical fault for the existing system is a three-phase fault at Holyrood under peak load conditions. As discussed in Hydro's response to IC-NLH-006, a critical fault for the system following the HVdc interconnection is a three-phase fault at Bay d'Espoir under peak load conditions. Without the proposed 230 kV transmission line between Bay d'Espoir and Western Avalon, other faults in this corridor also become critical faults. An example of this is discussed on page 35 of the report.

As discussed on page 12 of the report, severe faults can cause a temporary shutdown of the Soldiers Pond converter (commutation failure) and, at the same time, the electrical power from the Bay d'Espoir Generating Station feeds into the fault. Without any generation at Holyrood and an interrupted supply from the HVdc link, the deficit of reactive power on the Avalon Peninsula results in instability.

With the new 230 kV transmission line between Bay d'Espoir and Western Avalon, the system is reinforced such that rotating machines on the Avalon Peninsula can maintain synchronism following a disturbances within the Bay d'Espoir to Western Avalon corridor (with the exception of a three-phase fault at Bay d'Espoir under peak load conditions with one high inertia synchronous unavailable).