Q. **Re: PUB-NLH-217**

Citation (p. 8):

A full loss of the LIL, referred to as a permanent bipole failure, will result in immediate curtailment of the export of the Nova Scotia capacity and loss of a maximum of 673 MW of capacity on the Island Interconnected System. The loss of 673 MW to the Island Interconnected System will require load shedding of up to 673 MW in order to rebalance on Island generation with load and return system frequency to normal. This load shedding scheme is under study to determine appropriate trigger levels and allocation across the Island.

Please describe, in general terms, the impacts of a sudden loss of 673 MW of capacity on the Island Interconnected System, and indicate when the load shedding scheme will be provided.

A. Under normal operation, small imbalances between load and generation result in a change in system frequency. For a loss of online generation capacity, or increase in customer load, the system frequency begins to fall. The change in system frequency causes generator governor action, which, together with automatic generation control, restores the system frequency to normal. The sudden loss of 673 MW of capacity on the Island Interconnected System will result in a significant imbalance between the load and generation capacity and subsequently causes a significant decay in system frequency. The generation loss of 673 MW represents approximately 40% of the total generation capacity of the Island Interconnected System during peak load conditions. In general terms, a sudden loss of generation of this magnitude on the Island Interconnected System will result in the collapse of the entire system if immediate intervention is not initiated to restore the balance between remaining generation capacity and system load. To restore the balance

between remaining generation capacity and load, an automatic under frequency load shedding scheme[1] is utilized to remove load from the system to stabilize the frequency. With the generation and load balance restored, the system frequency will return to a stable state. Automatic generation control and the start-up of standby generation will then be used to restore customer load and to return the frequency to normal levels.

The design of the under frequency load shedding scheme necessary for the permanent bipole fault on the Labrador – Island HVdc Link will be completed as part of the detailed operational studies to be conducted in the 2015-2016 time frame following the completion of the HVdc vendor's detailed design and the benchmarking of the final PSS®E and PSCAD™ models.

[1] The under frequency load shedding scheme utilizes under frequency relays located at pre-determined locations to command circuit breakers to trip specific amounts of load at specific low frequency levels (i.e., 58.8 Hz, 58 Hz, etc.).