Q. With reference to IC-NLH-011, Appendix B page 39 of 57 indicates UFLS would be the only mechanism to offset a loss of supply. Would the result of insufficient UFLS in relation to LIL inflow be a larger scale outage? If so, what would be the scale and expected timing and frequency of such an event? (e.g., it appears likely to occur in summer).

A. The Labrador-Island Link ("LIL") bipole transfer limits are set to ensure the system frequency of the Island Interconnected System remains above 58 Hz following a LIL bipole trip. The two primary mechanisms to offset the loss of LIL supply are Maritime Link runbacks and under frequency load shedding ("UFLS"). A Maritime Link runback is an instantaneous reduction in exports following a LIL trip.

The impact of an insufficient amount of UFLS would be the same as a scenario where LIL bipole flows exceeded their limits. The Island system frequency decreases significantly following a LIL bipole trip. The smaller the amount of UFLS, the lower the frequency will drop following a bipole trip. Therefore, if LIL power transfer is set beyond its limit, there will be an insufficient amount of UFLS to withstand a LIL bipole trip and the system frequency would drop below 58 Hz.

System instability is a probable outcome once the frequency drops below 58 Hz, which could result in a forced unplanned outage of the entire Island Interconnected System; insufficient UFLS could result in severe consequences. However, Hydro has reserved a 58 Hz UFLS block intended to be utilized only in the event the LIL is operating beyond its limit at the time of a LIL bipole trip. This block is Newfoundland and Labrador Hydro's ("Hydro") last line of defense against system instability.

System instability should not occur following a LIL bipole trip if LIL transfer limits are being followed, as limits are set based on the current amount of available UFLS. LIL flow and LIL transfer limits are monitored and controlled by the system operators, with alarms in place that will activate when the LIL limits are exceeded.

There is a risk of system instability anytime the LIL transfer limits are exceeded, regardless of the time of year, because there would be an insufficient amount of available UFLS to withstand a LIL bipole trip. In the event of a LIL bipole trip when operating beyond its limits, the triggering of the 58 Hz block may be enough to avoid system instability but this is not guaranteed and its success would depend on the magnitude at which the limits are being exceeded. The activation of the 58 Hz block would equal approximately 160 MW of additional customer load shed during peak conditions.

Hydro is currently investigating other options that could be technically viable to offset the loss of supply following a LIL bipole trip. Please refer to Hydro's response to PUB-NLH-339 of this proceeding for more details.