Q. Reference CA-NLH-034 and PUB-NLH-157: Please provide an update on the work needed to minimise the consequences of breaker failures on system outages.

A. The following initiatives have been undertaken by Hydro to minimise the consequences of breaker failures on system outages:

1. A "Review of Breaker Failure Protection in 230 kV Stations to Identify Stations Where Breaker Failure is not initiated by a Transformer Protection Operation" report was completed in December, 2014. The report identified eight terminal stations[1] where transformer protection does not initiate breaker failure. Protection scheme designs and applicable drawings were revised in 2015. Implementation is ongoing and the modifications have been completed at six of the eight sites to date.

2. A "Review of Breaker Failure Protection in Existing 66 kV and 138 kV Stations" report was completed in December, 2014. Twenty stations (138 and 66 kV) were identified as not having breaker failure protection. It was decided that of these stations, protection schemes would be addressed at the most critical sites including terminal stations in the Stony Brook-Deer Lake 138 kV loop as well as for major 138 kV terminal stations on the Great Northern Peninsula. These modifications are discussed below.

3. A 2016 capital budget proposal was approved to install breaker failure protection at Howley Terminal Station (138 kV), Indian River Terminal

[1] These terminal stations are: Sunnyside, Hardwoods, Oxen Pond, Holyrood, Bottom Brook, Buchans, Deer Lake and Massey Drive.

Station (138 kV) and Hinds Lake Generating Station (13.8 kV). This work will be completed in 2017.

4. A capital budget proposal will be submitted for 2017 to install breaker failure protection at Berry Hill and Peters Barren 138 kV terminal stations.

5. Hydro developed a Protection and Control Standard for Breaker Failure, which was completed in July, 2015.