Q. Please provide Hydro's justifications for determining that major maintenance should be performed on service-aged terminal station transformers and on service-aged air blast circuit breakers every six years rather than some other interval. In the response include any references or recommendations from manufacturers and from consultants Hydro considered in determining the appropriate timing and provide comparisons with what Hydro understands other electric utilities to do.

A. Hydro's justifications for determining that major maintenance should be performed on service-aged terminal station transformers and on service-aged air blast circuit breakers every six years, rather than some other interval, is based on information from an internal maintenance review completed in 2002/2003 using Reliability Centered Maintenance (RCM) techniques with data input based upon the experience of Hydro's senior technical experts in this area.

Another internal maintenance review was completed in 2010/2011 to review the Terminal Asset Maintenance Strategy (AMS). Equipment history regarding failure rates and recurring issues was obtained from: (1) maintenance work orders; (2) CEA stats for outage data on transformers, circuit breakers and reactors; (3) Hydro's system performance and equipment review; and (4) Hydro's Safe Workplace Observation Program (SWOP) data base for terminal station incident and analysis reports. Manufacturers' recommendations were reviewed in original manufacturer manuals (OEMs). Also, for transformer maintenance, consideration was given to the text book entitled *Transformer Maintenance Guide*, written by M. Horning, J. Kelly and S. Myers. From this review there were no changes to the frequency of maintenance for transformers or breakers.

Following the events of January 2014, which involved substandard performance of air blast circuit breakers, Hydro re-evaluated the maintenance strategy for these types of breakers. Based on this exercise, the preventative maintenance (PM) frequency for air blast circuit breakers was moved from six years to four years. Other utilities consulted for their maintenance practices included Altalink, BC Hydro, Hydro One, Hydro Québec, Manitoba Hydro, NS Power, and Sask Power. Of those who responded within this group, for breaker PMs of similar scope the frequency ranged from two years to eight years, the one exception being one utility that used an operation-based frequency for frequently operated breakers (PM/1000 Operations), rather than a time based frequency. Hydro's PM scope for breakers is in line with what other utilities are doing. Regarding transformer PMs of similar scope, of those utilities who responded the frequency ranged from three years to eight years. Hydro's PM scope for transformers is in line with what other utilities are doing.