Q. Further to IC-NLH-162: Please confirm that if the Frequency Converter could be operated at a higher capacity closer to the nameplate rating, more Deer Lake hydro output could be delivered at 60 Hz, less power would be required to be produced at Holyrood, and the total costs to serve system loads would be reduced.

A. If the converter could be operated at a higher capacity, closer to its nameplate rating, and if CBPP was experiencing surplus inflows, it could operate the unit higher to reduce its energy consumption from the system. If, in turn, Hydro were not in a surplus storage position, this could result in a reduction in energy production from Holyrood and in the total costs to serve the system. However, due to the close geographic proximity of Hydro's watersheds to CBPP's Grand Lake watershed, they often experience similar climate and inflow patterns resulting in similar storage conditions. Therefore, if CBPP were in a surplus storage position and could turbine more water through its 50 Hz generators for conversion to 60 Hz, this would likely result in the displacement of Hydro's hydroelectric generation as Holyrood would already be reduced to minimum levels.

As indicated in Hydro's Amended Application (Section 2.2.2), since the closure of the Abitibi Grand Falls - Windsor Paper Mill and expropriation of the generating assets at Grand Falls, Bishop's Falls and Buchans in 2009, Holyrood has been reduced to minimum output[1]. This is through a combination of the new energy sources, reduction in Industrial Customer load and higher inflows in some years. As indicated in the response to NP-NLH-073 there has been a significant amount of energy spilled from Hydro's reservoirs since 2009, particularly in the years 2010, 2011 and 2013. Therefore, any increased energy production from the converter

[1] The units have been operated primarily for system reliability and Avalon transmission support.

during this period would likely have displaced Hydro's hydroelectric generation, resulting in increased storages and spill rather than to displace Holyrood.

On a forecast basis, it is expected that Holyrood will be increased above minimum levels due to the anticipated increases in Utility and Industrial load requirements, with the latter primarily related to the ramp up of operations at the Vale nickel processing facility. However, it is Hydro's understanding that CBPP is able to utilize the average annual inflows into its watersheds[2] under the present rating of the converter. As indicated in Hydro's response to IC-NLH-186, CBPP has 81.1 MW of 60 Hz generation at its Deer Lake Powerhouse. In addition, Hydro estimates that CBPP is able to utilize 30-32 MW of its 50 Hz generation through conversion at the frequency converter and through consumption by the remaining 50 Hz loads at the Mill. This results in up to 113 MW of generation that can be used to supply Mill firm power requirements and should allow CBPP to utilize the average inflows into its watersheds.

Under periods of excess inflows, an increase in the rating of the converter could allow CBPP to increase its 60 Hz production, thereby reducing its requirements from the system. However, as indicated previously, these periods are likely to coincide with periods of high inflows and storages in Hydro's reservoirs, resulting in a displacement of hydroelectric generation rather than a displacement of Holyrood.

It is possible that CBPP could plan to utilize more than the average inflows into its reservoirs, aided by an increase in the rating of the converter. Under average reservoir conditions for Hydro this could result in energy savings at Holyrood; however Hydro does not consider this to be a prudent water management strategy

[2] It is Hydro's understanding that the historical annual inflows into the Grand Lake and Corner Brook Lake watersheds equate to approximately 100 MW on average.

because overdrawing could lead to reduced future hydroelectric generation and an increase in Holyrood production requirements.

For a further discussion of the frequency converter capacity, please see Hydro's response to IC-NLH-186.