Q. **Re: 2018 CBA, MFHVI Project, Revision 2 (2018-01-25), pages 34-35 (pdf)**

Citation 1 (page 14 of pdf):

Five power supply options for the Upper Lake Melville area were analyzed from both a technical and cost benefit point of view. It was shown that while maintaining long term supply from Churchill Falls (status quo) with an additional 125 MVA transformer added at Churchill Falls, a 67 MVAR capacitor bank, and 50MVA transformer at Happy Valley – Goose Bay, had the lowest initial capital cost, it did not have the lowest cumulative net present value. Connection of the Upper Lake Melville to Muskrat Falls via construction of a six km long transmission line from the existing 138 kV right of way to the Muskrat Falls site had the lowest cumulative net present value of the five options.

Preamble:

i. The capital cost for Option 1 (125 MVA transformer at CF, 65 MVA Capacitor Bank, new 50 MVA transformer at HV) is given as $4.05 + $5.0 + $3.8 = $12.85 million. O&M costs are given as $450k/yr. The study assumed an annual one-week maintenance outage of L1301/L1302 for cross-arm replacement, requiring operation of the HV Gas Turbine, at a cost of $1.33 M/yr. (pages 34-35 of pdf) The analysis shows that, during that one-week maintenance outage, HV (including data centre loads) would occasionally exceed the 25 MW limit of the HVGT.

ii. Option 2 (the MFHVI project) shows a capital cost of $20.0 M, and O&M of $470k/yr. A maintenance outage is required for cross-arm replacement for L1302 only, and the HVGT usage estimate is prorated based on line length and estimated at $165.8k/yr. Loss savings are estimated at $1 M/yr (p. 38 pdf).

iii. Cumulative NPV is estimated at $33,478,915 for Option 1, and at $23,577,661 for Option 2. (page 54 of pdf)

a) Please provide detailed calculations showing the derivation of the NPV figures mentioned in Preamble iii), with references and sources for all data and assumptions used.

b) Please indicate the reduction in NPV for Option 1 that would result if data centre customers were curtailed during the maintenance outage, reducing fuel costs.

A.

a) Detailed figures, data, and assumptions used for the cumulative net present value ("NPV") analysis are provided in Revision 2 of the "Muskrat Falls to Happy Valley Interconnection" report, Appendix A "Eastern Labrador Transmission System Planning Report," Section 8, Appendices I and J.

The Cost Benefit Analysis provided in Section 8 includes a high level scope of the proposed option, the associated capital investment cost, the operation and maintenance ("O&M") costs, and assumptions. A summary of results is provided in Section 8, Table 2.

Supporting details for all figures provided in Section 8 can be found in Appendix I and Appendix J. Appendix I contains a detailed summary of operation and maintenance cost assumptions (for all major assets associated with each technical alternative). Appendix J contains detailed cash flow tables, which summarize annual O&M costs, capital costs, as well as all other costs and benefits associated with each alternative. Cash flows for Option 1 and Option 2 are presented in Tables J.1 and J.2, respectively. These values are the inputs to perform the NPV analysis presented in Section 8, Table 2.

b) Newfoundland and Labrador Hydro does not have the authority to curtail customers in this fashion. Therefore, the calculations necessary to provide this information have not been made as such an exercise will not contribute to the value of the current proceeding.