

2018 Capital Budget Application – Muskrat Falls to Happy Valley Interconnection Project

1 Q. **Re: Labrador Expansion Study, p. 35 (pdf); 2018 CBA, MFHVI Project, Revision 2**
2 **(2018-01-25), pages 47, 50 and 54 (pdf)**

3 Preamble:

4 In the Labrador Transmission Expansion Study, Table 7 compares the CPV of the
5 MFHVI interconnection (Alternative 2) to that of “Offload L1301/L1302”
6 (Alternative 1), and shows a difference of \$30.9 million.

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8 In the MFHVI Project, Revision 2, Option 2 (the MFHVI project) is compared to
9 Option 1, which includes additional transformers and a capacitor bank, with a CPV
10 difference of \$9.9 million.

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12 a) Please explain in detail the difference between “Alternative 1” in the Labrador
13 Transmission Expansion Study and “Option 1” in the MFHVI Project
14 documentation.

15 b) Please explain why the CPV difference is so much larger in the Labrador
16 Transmission Expansion Study than it is in the MFHVI Project documentation.

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19 A.

20 a) The “Muskrat Falls to Happy Valley Interconnection” report (the “Report”),
21 Revision 2, Option 1 involves the addition of 67 MVAR of capacitor banks at the
22 Happy Valley Terminal Station to increase the transfer capacity of transmission
23 system to 104 MW. This is in contrast to Alternative 1 of the “Labrador
24 Interconnection System Transmission Expansion Study” which involves no
25 capital additions to increase the transfer capacity of the system from 77 MW,
26 but instead uses offloading the transmission system using customer
27 interruption and thermal generation.

1 The addition of capacitor banks, as presented in Revision 2 of the Report,
2 Option 1 was not included in the “Labrador Interconnection System
3 Transmission Expansion Study.” As part of the detailed analysis performed in
4 this study, it was confirmed that the addition of capacitor banks would result in
5 unacceptable overvoltage conditions. In the event of the loss of load at the
6 Happy Valley Terminal Station, voltages would reach approximately 1.5 per unit
7 (207 kV) on the 138 kV system. The coordination of protection for such an event
8 is not practical and the option was therefore dismissed as not being technically
9 viable.

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11 Alternative 1, as presented in the “Labrador Interconnection System
12 Transmission Expansion Study” therefore requires customer interruption and
13 thermal generation to offload the system.

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15 b) The Cumulative Present Value difference that was calculated as part of the
16 economic analysis for the “Labrador Interconnection System Transmission
17 Expansion Study” is significantly higher for the following reasons:

- 18 • Additional fuel cost associated with the increased operation of the
19 Happy Valley Gas Turbine for Alternative 1;
- 20 • Additional costs associated with Interruptible Service Options for
21 Alternative 1; and
- 22 • In Revision 2 of the Report, losses were evaluated using the cost of
23 energy at the recapture rate of \$2 per MWh. For the “Labrador
24 Interconnection System Transmission Expansion Study,” it was
25 determined that it would be more appropriate to evaluate losses using
26 the export value of energy, which was approximated at \$35 per MWh.