



Sheffield-Highgate Export Interface Alternatives Study

Introduction

The summary describes consulting services currently being conducted for Vermont Transco to assess subtransmission, reactive support, and transmission options, including battery storage, and rank these options or sets of options in terms of their performance in comparison to the existing system under all-lines-in and facility-out conditions. Essentially, the analysis will allow us to determine the incremental MW export benefit of the options compared to the existing system. When the voltage limit exceeds the thermal limit for an option, both limits should be provided. Below is a description of the options to be evaluated.

These options are not planned upgrades, and the majority, particularly the transmission line additions, will likely be rejected because of their high cost compared to the export benefit they provide and/or the infeasibility of implementation. Economic and impact evaluation of alternatives will be completed as needed in a later phase.

Subtransmission upgrade

Option 1: reconductor the B20 line and replace the Lowell 46/34.5 kV transformer

Reactive support

Option 2: Enable the AVR of one plant

Option 3: Demonstrate that the Jay synchronous condenser can be operated at a higher capacity for 1 hour

Option 4: Enable the AVR of another plant

Option 5: Install a 15 MVAR synchronous condenser at Highgate

Transmission upgrades

Option 6: Reconductor the K42 line

Option 7: Install a second line across the interface from station 220 to station 210

Option 8: Install a 15 MVA battery storage at Highgate (size to be confirmed by study)

Option 9: Reconductor the K41 line

Option 10: Install a new line across the interface from station 230 to station 666

Option 11: Install a new line across the interface from station 230 to station 390

The following table provides the cases that VELCO proposes for testing. Case 0 represents the existing system. Cases 1 to 18 represent the upgraded system with an X indicating which options are included in each of the cases.

| Options | Cases | | | | | | | | | | | | | | | | | | |
|---------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | |
| 2 | | | X | | | X | X | | X | X | X | X | X | X | X | X | X | X | X |
| 3 | | | | X | | X | | X | X | X | X | X | X | X | X | X | X | X | X |
| 4 | | | | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 5 | | | | | | | | | | X | | | | | | | | | X |
| 6 | | | | | | | | | | | X | | | | | | | | X |
| 7 | | | | | | | | | | | | X | | | | | | | |
| 8 | | | | | | | | | | | | | X | | | | | | |
| 9 | | | | | | | | | | | | | | X | | | | | |
| 10 | | | | | | | | | | | | | | | X | | | | |
| 11 | | | | | | | | | | | | | | | | X | | | |