Sheffield-Highgate Export Interface

SHEI

vermont electric power company

VELCO

OC meeting

August 17, 2017

VELCO Northern Vermont Export Study

- Purpose: Provide information to enable VELCO and DUs to evaluate all potential “transmission” solutions
  - Reactive support, transmission, subtransmission, and battery storage
    - Will analyze individual elements and combinations of solutions
  - Consultant’s analysis to provide basis for costing of options
- Fast turnaround for analysis—report due late August
  - Economic evaluation by October 2017
- Consultation with stakeholders through a working group
  - Requires efficient process due to tight deadlines
  - Early stage to ensure analysis addresses stakeholders’ data needs
  - Late stage to understand/clarify results

Solution options/cases to be tested

- Equipment utilization
  - Voltage regulation at existing power plants
- Equipment installation
  - Synchronous condenser, battery storage
- Transmission and subtransmission line upgrades
- New transmission lines

Analysis description from the RFP scope

- VT Transco is seeking consulting services 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 of these options, particularly the transmission line additions, will likely be rejected because of their high cost compared to the export benefit that they provide.

Initial options considered from the RFP scope

- **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: Jay synchronous condenser higher capacity demonstrated for at least 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

Initial cases being tested from the RFP scope

	Cases																	
Options	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			

Potential additional analysis will cause delays

- Close a switch at the Lowell station creating the Jay loop
- Cases 2 to 7 without option 1, the B20 upgrade
- Options 2, 3 and the Jay loop together but without option 1
- Case 8 with only the battery option at Highgate
- Case 8 with the battery alone but at the eastern end of SHEI