



vermont electric power company



Florence Substation Asset Condition Project

Vermont System Planning
Committee (VSPC)
Geographic Targeting
Subcommittee

May 28, 2020

Project objective

- Project will mitigate asset condition concerns
 - 115 kV circuit switcher does not meet available short circuit duty
 - Obsolete and degraded protection & control and equipment
 - Inoperable 46 kV capacitor bank due to harmonic resonance
 - Causes bus fault and blows fuses when operated
 - Concrete foundation and structural steel deficiencies including severe settling of the 115 kV transformer foundation
 - Oil containment not up to current standards

Project scope of work

- Replace existing 46 kV radial bus with a new, four breaker ring bus built adjacent to the existing radial bus on land currently owned by VELCO
- Replace 115 kV circuit switcher and 46 kV breakers
- Replace capacitor bank and breaker
 - Install on a ring position shared with a 46 kV line
- Replace control building and protection and controls system
- Preliminary cost estimate
 - \$15.2M
 - Class B estimate: +/-25%

Benefits of the Proposed Ring Bus over the Existing Radial Bus

- Cost savings by eliminating the need for a temporary substation during construction
- Ring bus not susceptible to losing the entire 46 kV bus for a 46 kV bus fault or any 46 kV circuit breaker failure scenario
- Ability to take any breaker out of service without interruption of service. The radial design required removal of hard bus breaker bypasses (due to protection degradation) and required line-tie provisions for the H11 circuit
- Ring bus not susceptible to losing all protection coordination for a bus voltage transformer (VT) failure, maintenance , or blown fuse (loss of potential)

NTA Screening

Vermont Non-Transmission Alternatives Screening Form

For use in screening to determine whether or not a transmission system **reliability issue** requires non-transmission alternatives (NTA) analysis in accordance with the Memorandum of Understanding in Docket 7081. Projects intended for energy market-related purposes – “economic” transmission – and other non-reliability-related projects do not fall within the scope of the Docket 7081 process.

Identify the proposed upgrade:	<u>Florence Asset Condition Mitigation Project</u>
Date of analysis:	<u>May 14th, 2020</u>
1. Does the project meet one of the following criteria that define the term “impracticable” (check all that apply)?	
a. Needed for a redundant supply to a radial load; or	<input type="checkbox"/>
b. Maintenance-related, addressing asset condition, operations, or safety; or	<input checked="" type="checkbox"/>
c. Addressing transmission performance, e.g., addition of high-speed protection or a switch to sectionalize a line; or	<input type="checkbox"/>
d. Needed to address stability or short circuit problems; ¹ or	<input type="checkbox"/>
e. Other technical reason why NTAs are impracticable. Attach detailed justification that must be reviewed by the VSPC.	<input type="checkbox"/>
<i>If any box above is checked, project screens out of full NTA analysis.</i>	
2. What is the proposed transmission project’s need date?	<u>Not applicable</u>
<i>If the need for the project is based on existing or imminent reliability criteria violations (i.e., arising within one year based on the controlling load forecast), project screens out of full NTA analysis.</i>	

¹ “Stability” refers to the ability of a power system to recover from any disturbance or interruption. Instability can occur when there is a loss of synchronism at one or more generators (rotor angle stability), a significant loss of load or generation within the system (frequency stability), or a reactive power deficiency (voltage stability). Stability problems are influenced by system parameters such as transmission line lengths and configuration, protection component type and speed, reactive power sources and loads, and generator type and configuration. Due to the nature of instability, non-transmission alternatives involving addition of generation or reduction of load will not solve these problems.

NTA Screening (continued)

3. Could elimination or deferral of all or part of the upgrade be accomplished by a 25% or smaller load reduction or off-setting generation of the same magnitude? Yes No
(See note.)

If "no," project screens out of full NTA analysis.

4. Is the likely reduction in costs from the potential elimination or deferral of all or part of the upgrade greater than \$2.5 million. (See note.) Yes No

If "no," project screens out of full NTA analysis.


Sign and date this form.

This analysis performed by: Hantz A. Pr sum  – System Planning Manager

Print name & title

VELCO
Company

May 14th, 2020
Date


Signature