



Taft Corners 115/12.47kV Transformer Backup Solution

vermont electric power company



June 21, 2023

VSPC Geographic Targeting
Subcommittee

Substation history

- Tafts Corner substation was constructed in 2004
 - To increase the reliability and load-serving capability of the GMP and VEC subtransmission system in the Williston area
 - Included a control building, 115/34.5kV transformer with one 115kV breaker, one 34.5kV breaker, with associated equipment
 - Substation was designed for future consideration of area load growth that included provisions for a 115kV ring bus serving two additional 115/12.47kV transformer circuits, 12.47kV switchgear and associated apparatus
- Tafts Corner substation was upgraded in 2009
 - To serve the local GMP and VEC 12.47kV distribution systems
 - Included a four-breaker 115kV ring bus, 115/12.47kV transformer, two 12.47kV switchgear five-breaker distribution busses, tie-breaker two transformer source breakers with one installed for emergency service and future upgrades

Project objective

- Maintain supply to 12.47 kV load during single T2 115/12.47kV transformer outage
 - GMP cannot serve the local VEC load
 - VEC cannot serve any of their Tafts load from Hinesburg
 - Requires lengthy protection rework and operating the 115kV ring bus open
 - 24-hour restoration
- The 115/13.2kV spare transformer will remain a backup solution for 115/12.47kV GMP/VEC and 115/13.8kV BED sources
- Option selected as preferred based on
 - Reduced risks by eliminating rework of 115kV circuits
 - Simplified maintenance
 - Improved system reliability and load restoration times for emergencies
 - Reasonable cost allocations

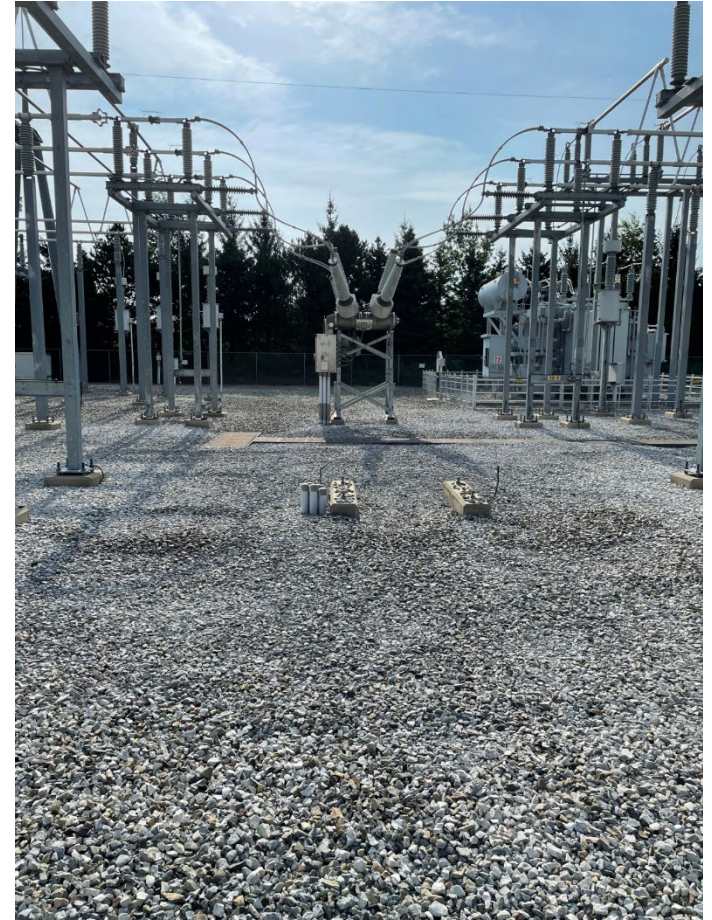
Project Scope and Schedule

- Scope
 - Install new 115kV breaker on the existing breaker foundations
 - Install a 115kV voltage transformer on a new foundation and steel mounting stand
 - Install new breaker protection relays and controls in the existing relay/control panels
 - Including all required hardware, cable and wiring
- Schedule
 - 248(j) regulatory filing – September 2023
 - Engineering and drawings development – Q4 2023
 - Equipment specifications and procurement – Q4 2023
 - Construction – June – September 2024
 - Cutover and commissioning – September 2024
- Cost estimate - \$842,351 with 20% contingency
 - Includes \$765,013 as PTF

Spare T3 Position – HV Connections Made Ready



Spare Breaker Position for K23-40



- The future breaker position foundations and conduits are installed

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>Tafts Corner Backup Transformer Project</u>										
Date of analysis:	<u>June 13th, 2023</u>										
<p>1. Does the project meet one of the following criteria that define the term “impracticable” (check all that apply)?</p> <table><tr><td>a. Needed for a redundant supply to a radial load; or</td><td><input checked="" type="checkbox"/></td></tr><tr><td>b. Maintenance-related, addressing asset condition, operations, or safety; or</td><td><input type="checkbox"/></td></tr><tr><td>c. Addressing transmission performance, e.g., addition of high-speed protection or a switch to sectionalize a line; or</td><td><input type="checkbox"/></td></tr><tr><td>d. Needed to address stability or short circuit problems;¹ or</td><td><input type="checkbox"/></td></tr><tr><td>e. Other technical reason why NTAs are impracticable. <i>Attach detailed justification that must be reviewed by the VSPC.</i></td><td><input type="checkbox"/></td></tr></table> <p><i>If any box above is checked, project screens out of full NTA analysis.</i></p>		a. Needed for a redundant supply to a radial load; or	<input checked="" type="checkbox"/>	b. Maintenance-related, addressing asset condition, operations, or safety; or	<input 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. <i>Attach detailed justification that must be reviewed by the VSPC.</i>	<input type="checkbox"/>
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<p>2. What is the proposed transmission project’s need date? <u>Not applicable</u></p> <p><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></p>											

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. Présumé – System Planning Director

Print name & title

VELCO

Company

June 13th, 2023

Date



Signature