

Highgate Substation Condition Assessment Project Overview

Highgate
Select Board Meeting

August 18, 2022

vermont electric power company

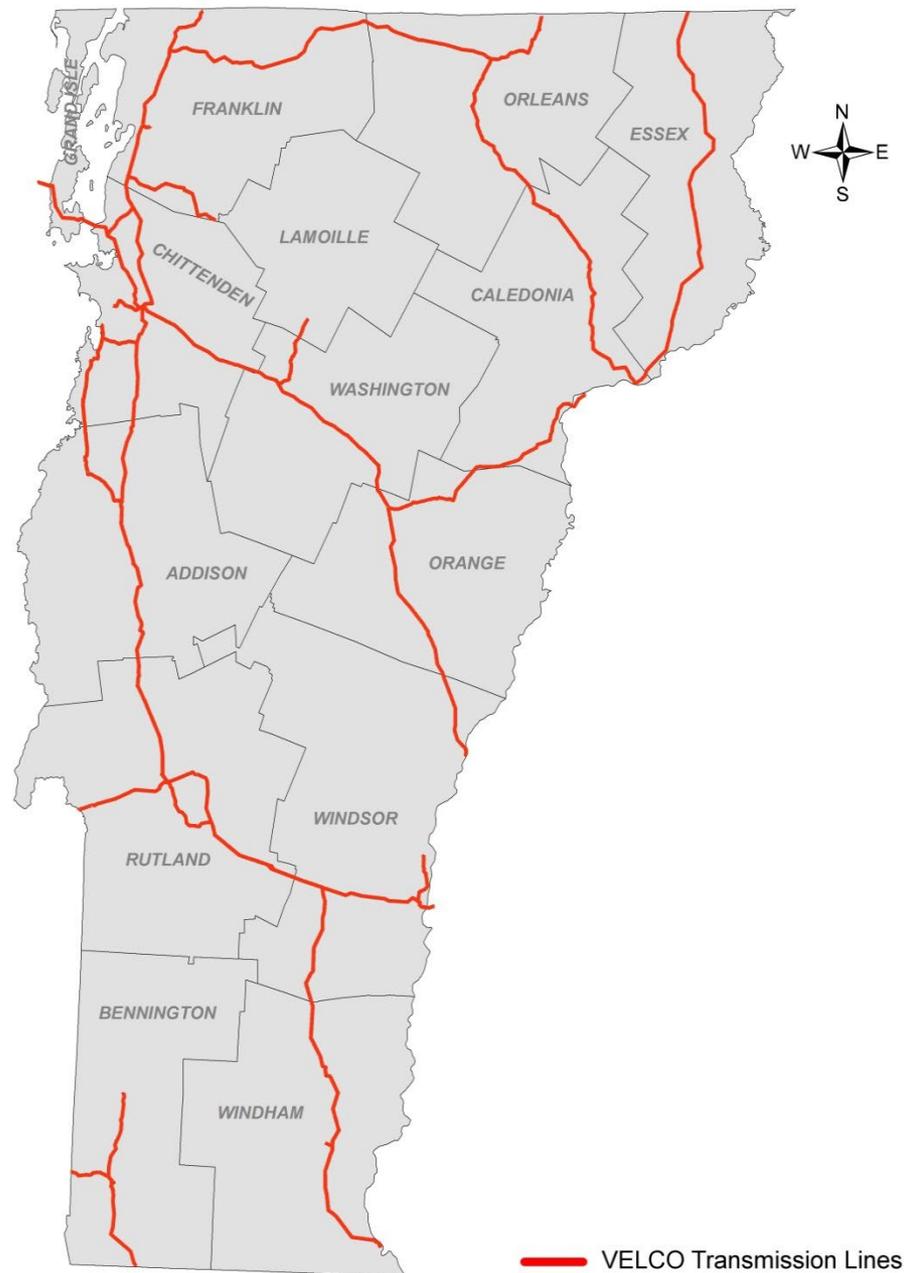


VELCO Background

- Regulated electric transmission utility that provides service to the electric distribution utilities in Vermont
- Manages a system that includes:
 - 738 miles of transmission lines (345, 230 and 115kV)
 - 13,000 acres of rights-of-way
 - 55 substations, switching stations and terminal facilities
 - Equipment that enables interconnected operations with Hydro-Québec
 - Fiber optic communication networks that monitor and control the electric system and serve as a key link for Vermonters' high-speed data internet access
 - 52 mile, 450 kV direct current line through the Northeast Kingdom owned by Vermont Electric Transmission Company (VETCO)

VELCO Background

- Formed in 1956 as nation's first statewide, "transmission-only" company
- Owned by 17 local electric distribution utilities
- Regulated by the VT Public Utility Commission
- Managed assets include \$1.2 billion electric transmission grid consisting of:
 - 738 miles of transmission lines
 - 13,000 acres of rights-of-way
 - 55 substations, switching stations, and terminal facilities
 - 1500 miles of fiber optic communication network
 - Statewide Radio System
 - Equipment that enables interconnected operations with Hydro-Québec



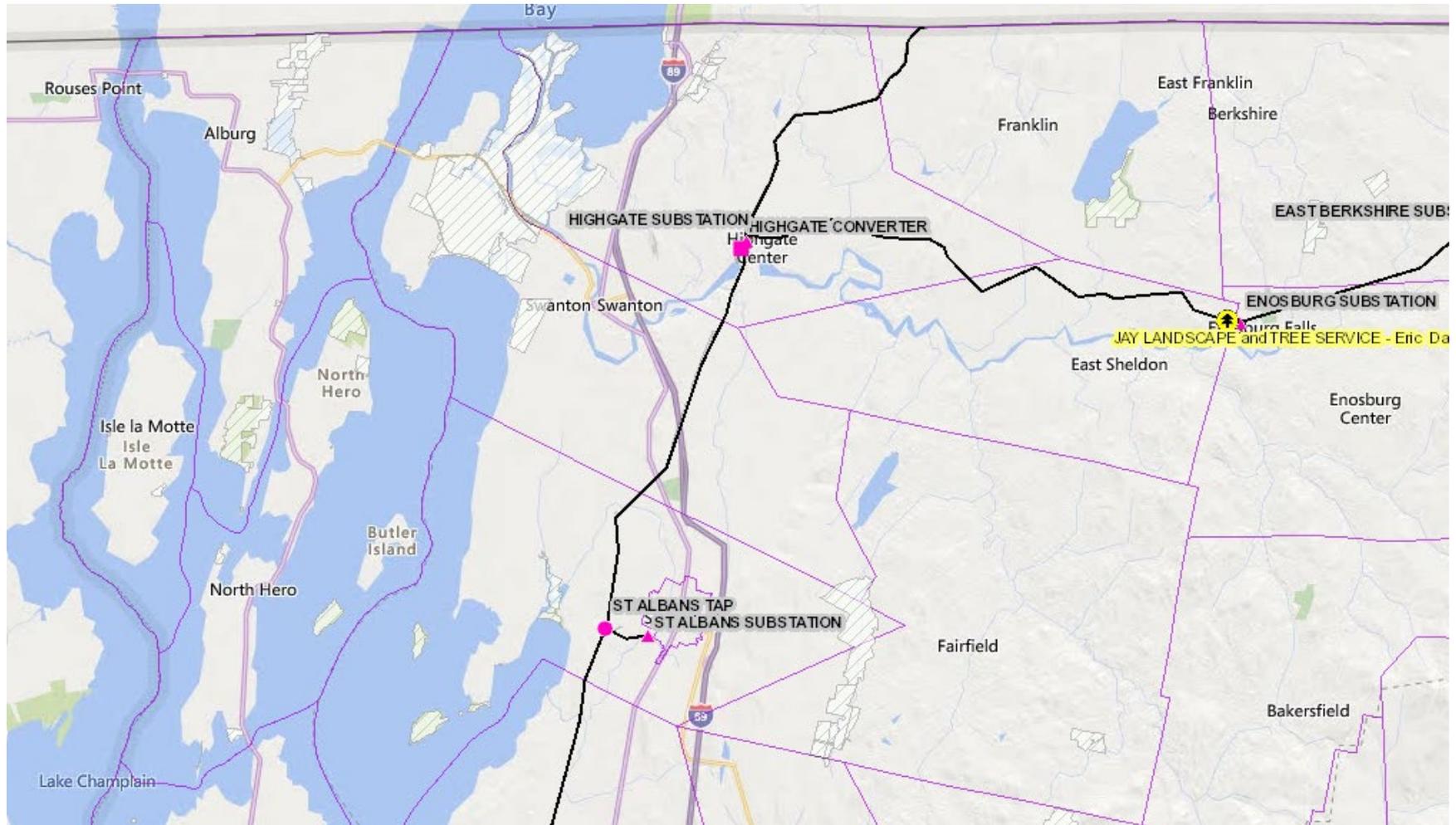
Substation Condition Assessment Program

- Condition assessment intended to identify physical equipment or designs that would be considered deficient.
- Evaluation criteria was established in 2013 to assess substations on the VELCO system.
- Substation upgrades completed: Newport, St Albans, Barre, Berlin, Sandbar and Irasburg.
- Substation upgrades in progress: North Rutland and Florence
- Substation upgrades in 2023: Highgate and Middlebury

Highgate Substation

2731 Route 78

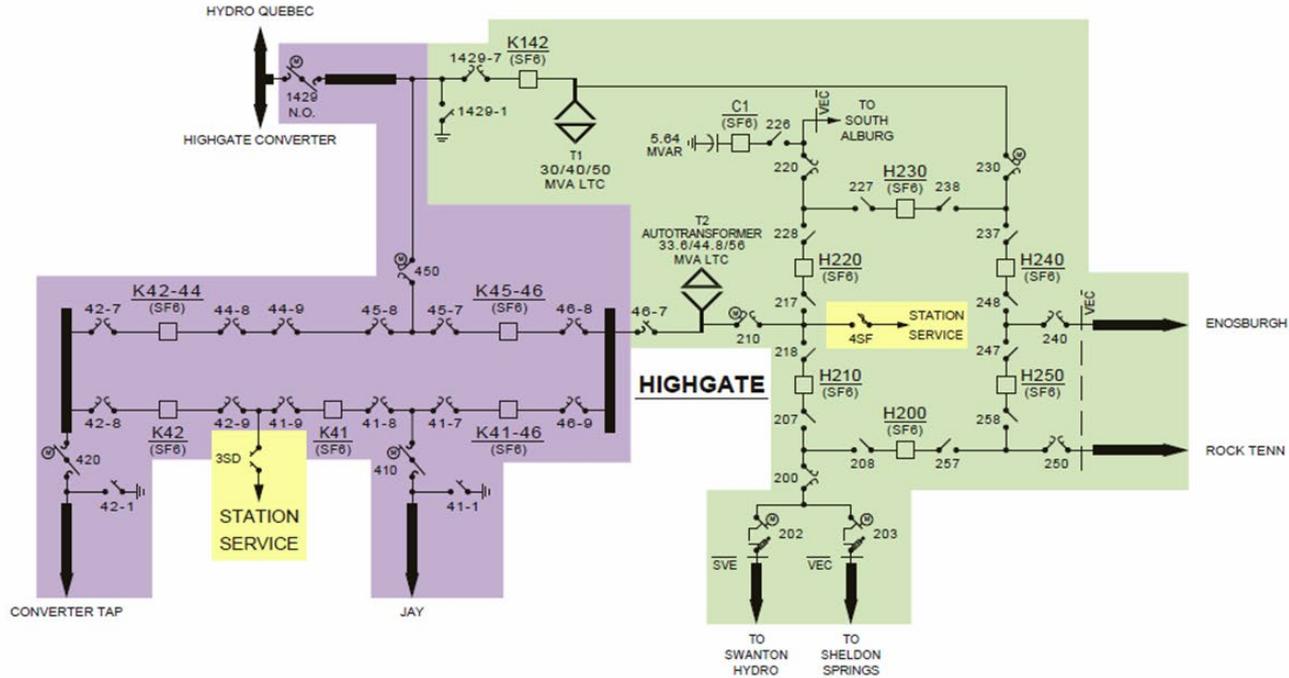
Highgate, VT 05459



Highgate Substation Aerial Photograph



Facility Classification Drawing



FACILITIES REFERENCE LEGEND

ISO-NEW ENGLAND PTF FACILITIES (COMMON FACILITIES):

POOL TRANSMISSION FACILITIES (PTF) ARE THE TRANSMISSION FACILITIES OWNED BY PARTICIPATING TRANSMISSION OWNERS (PTO), OVER WHICH THE ISO SHALL EXERCISE OPERATING AUTHORITY IN ACCORDANCE WITH THE TERMS SET FORTH IN THE TRANSMISSION OPERATING AGREEMENT (TOA), RATED 69KV OR ABOVE REQUIRED TO ALLOW ENERGY FROM SIGNIFICANT POWER SOURCES TO MOVE FREELY ON THE NEW ENGLAND TRANSMISSION SYSTEM. (OATT, II.49)

COMMON FACILITIES (NON-PTF):

VELCO FACILITIES THAT COMPRISE THE STATEWIDE, HIGH VOLTAGE TRANSMISSION GRID, INTERCONNECTING AND SERVING THE LOAD CENTERS OF THE STATE, AND ARE USED IN COMMON BY ALL PURCHASERS OF TRANSMISSION SERVICES ON A STATEWIDE BASIS. THIS INCLUDES FACILITIES CONSTRUCTED PRIOR TO 7-1-90, OR ANY SPECIFIC FACILITIES CONSTRUCTED AFTER 7-1-90 THAT HAVE BEEN RECLASSIFIED AS COMMON FACILITIES AS A RESULT OF BEING IN SERVICE FOR A PERIOD OF TEN YEARS.

SPECIFIC FACILITIES:

HIGH VOLTAGE LINES, SUBSTATIONS AND OTHER APPURTENANCES CONSTITUTING A DIRECT PHYSICAL CONNECTION TO THE VELCO (COMMON) TRANSMISSION SYSTEM AND ARE NOT PART OF THE LOOPED TRANSMISSION GRID. THESE FACILITIES ARE USED AND INSTALLED TO BENEFIT A REQUESTING PURCHASER OF TRANSMISSION SERVICE. IN THE CASE OF A SUBSTATION (STEPPING DOWN TO A LOWER VOLTAGE) THIS INCLUDES THE TRANSFORMER, HIGH SIDE CIRCUIT SWITCHER, BANK BREAKER, ANCILLARY DEVICES, CONTROLS AND CONTROL CIRCUITRY (REFER TO COMMON FACILITIES DEFINITION FOR CRITERIA OF RECLASSIFICATION).

EXCLUSIVE FACILITIES:

EQUIPMENT CONNECTED TO THE LOW VOLTAGE BUS, INCLUDING ANY ASSOCIATED PROTECTION, CONTROL, AND METERING SYSTEMS THAT HAVE BEEN CONSTRUCTED UNDER A VELCO WORK ORDER, AND ARE TO BE FULLY OWNED AND FUNDED BY THE PURCHASER OF TRANSMISSION SERVICE UPON COMMISSIONING. THIS TYPICALLY INCLUDES FOUNDATIONS AND STRUCTURES, BREAKERS AND SWITCHES, INSULATORS, LINE POTENTIAL TRANSFORMERS, CONDUIT, CABLE AND GROUNDING. ONGOING MAINTENANCE AND TESTING OF THESE FACILITIES ARE SUBJECT TO THE TERMS AND CONDITIONS OF VELCO'S SUBSTATION PARTICIPATION AGREEMENT.

SHARED FACILITIES (COMMON USE):

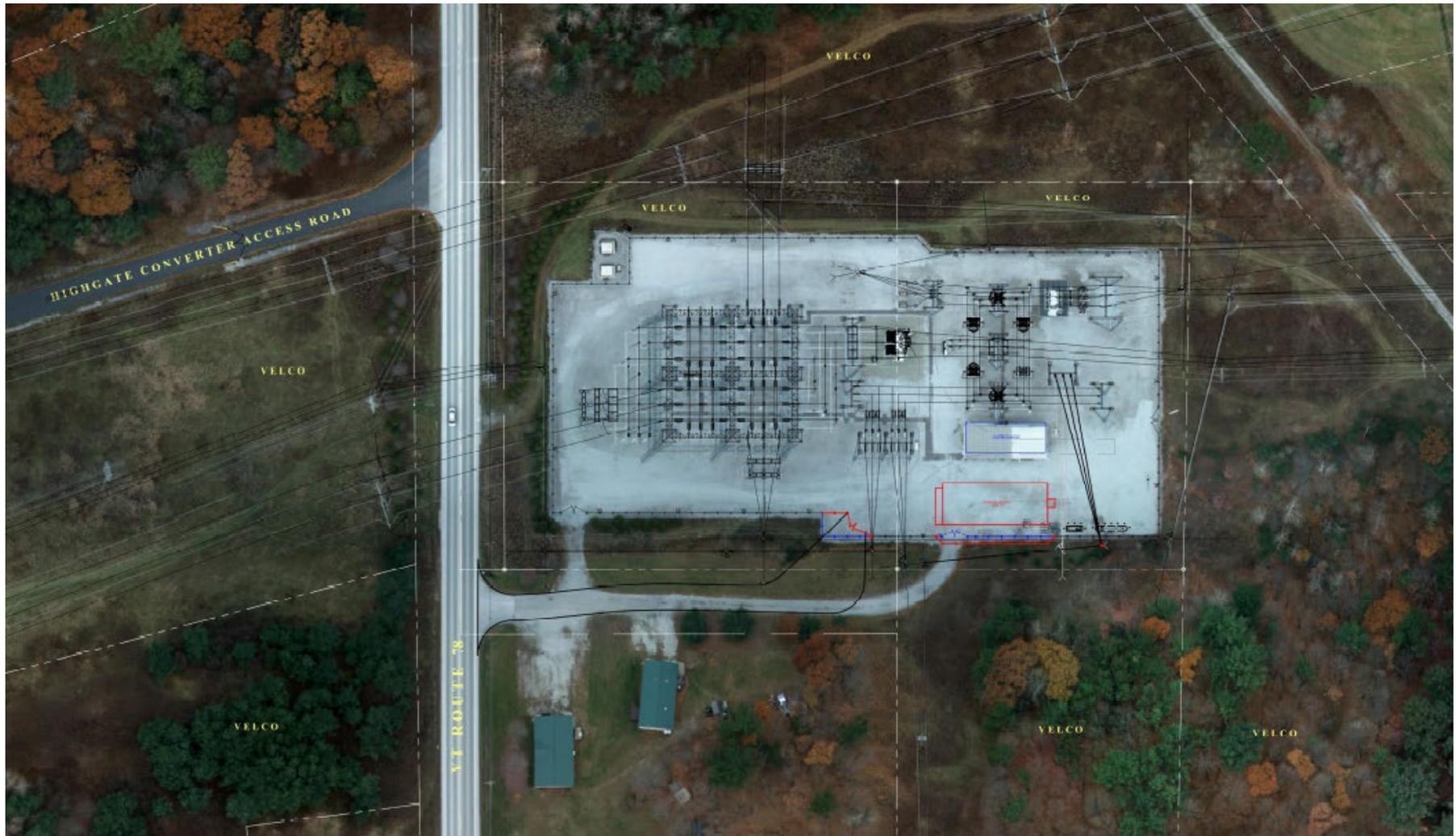
TYPICALLY CONSISTING OF EQUIPMENT LOCATED WITHIN SUBSTATIONS THAT ARE SHARED IN SOME MANNER FOR THE BENEFIT OF BOTH VELCO AND THE PURCHASER OF TRANSMISSION SERVICE. THIS INCLUDES STRUCTURES (BUILDINGS) AND IMPROVEMENTS, FENCING AND GATES, LOW VOLTAGE DISCONNECT SWITCHES, BUS WORK, LOW VOLTAGE POTENTIAL TRANSFORMERS (STATION SERVICE AND BUS POTS), COMPLETE STATION GROUNDING SYSTEMS, SUPPORTS AND CABLE TRAYS, BATTERIES AND CHARGERS, SWITCHSTICKS AND GLOWTECTORS, LADDERS, TABLES AND SUPPLY CABINETS. ONGOING MAINTENANCE AND TESTING OF THESE FACILITIES ARE SUBJECT TO THE TERMS AND CONDITIONS OF VELCO'S SUBSTATION PARTICIPATION AGREEMENT.

REV	DATE	DR	CK	DESCRIPTION
3	05-05-20	AG	EJM	CORRECTION TO PTF FACILITIES BOUNDARY
2	12-30-21	AG	AG	TEXT EDIT
1	08-12-18	AG	AG	TEXT EDIT

VELCO		VERMONT ELECTRIC POWER CO., INC. RUTLAND, VERMONT	
HIGHGATE SUBSTATION			
HIGHGATE SUBSTATION FACILITIES CLASSIFICATION DIAGRAM			
SCALE: NONE	DRAWN BY: AG	APPROVED BY:	DATE
DATE: 11-14-14	CHECKED BY: AG		3
DRAWING NUMBER: PLOT: 1=1	2720010B		REV.

FILE: P:\2720010B

Proposed Ortho Plan



Project Scope of Work

- Replace the existing control building (24'X61') with a larger control building (32'X80')
- Replace protection and controls system, DC battery system, communications equipment and security systems
- Expand a 90' section of the eastern side fence, 5 feet to the east, to accommodate new control building
- Relocate Vermont Electric Cooperative's existing 46kV conductors and pole approximately 30' to the north to accommodate the new control building
- Maintenance related improvements
 - Replace (5) 46 kV SF6 breakers with 72kV vacuum breakers
 - Replace (1) 115 kV SF6 breaker with possibly 145 kV vacuum breaker
 - Install monitoring systems on power transformer and circuit breakers
 - Replace (4) CVTs
 - Replace 2 pier foundations
 - Replace (18) 115 kV and (27) 46 kV lightning arrestors

Project Schedule

- Received Board of Director approval in June 2022 to file a 248 CPG application
 - Mailed 45 day letter on July 18, 2022
 - Planning to File 248J CPG application in September 2022
 - Anticipate receiving CPG in March 2023
 - Begin construction in April 2023
 - Commission substation in March 2024
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- Estimated Cost:
 - \$15.9M with 50% contingency