



Substation Condition Assessment Project Update

vermont electric power company



Operating Committee

May 19, 2022

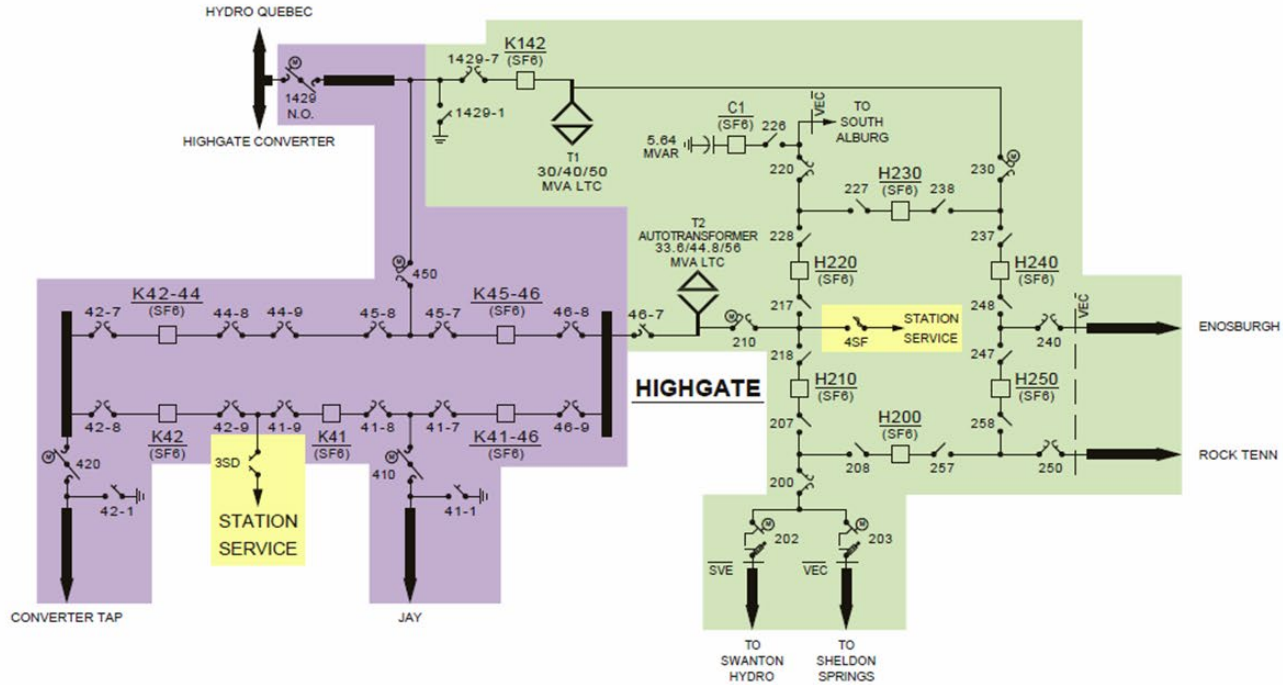
Highgate Substation



2731 Route 78
Highgate, VT 05459

Reconstructed in 2004

Facility Classification Drawing



FACILITIES REFERENCE LEGEND

ISO-NEW ENGLAND PTF FACILITIES (COMMON FACILITIES): [Purple Box]

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): [Green Box]

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: [Orange Box]

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: [Blue Box]

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): [Yellow Box]

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.

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

FILE: P:\2720010B



Project scope of work

- Replace the existing control building with a larger control building
- Maintenance related improvements
 - Replace the protection and control system
 - Replace A and B battery systems
 - 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 conduit and control cable system
 - Update security systems
 - Replace (18) 115 kV and (27) 46 kV lightning arrestors

Project Schedule

- Seek Board of Director approval in June 2022 to file a 248 CPG application
 - File 248 CPG application in July 2022
 - Anticipate receiving CPG in March 2023
 - Begin construction in April 2023
 - Commission substation in March 2024
-
- Estimated Cost:
 - \$15.9M with 50% contingency

Middlebury Substation

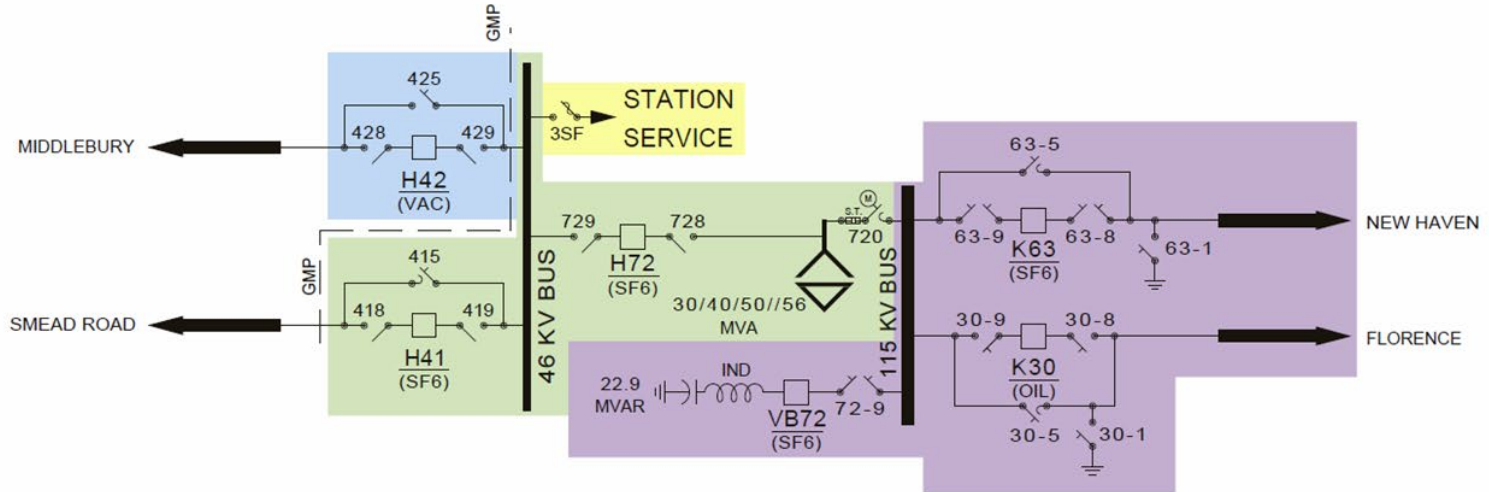


522 Quarry Road
Middlebury, VT 05753

Originally Constructed in 1969

Facility Classification Drawing

MIDDLEBURY



FACILITIES REFERENCE LEGEND

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COMMON FACILITIES (NON-PTF):

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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
1	08.12.19	AG	AG	UPDATED LEGEND
VELCO VERMONT ELECTRIC POWER CO., INC. RUTLAND, VERMONT MIDDLEBURY SUBSTATION				
MIDDLEBURY SUBSTATION FACILITIES CLASSIFICATION DIAGRAM				
SCALE: NONE		DRAWN BY: AG		APPROVED BY:
DATE: 11-14-14		CHECKED BY: AG		DATE
DRAWING NUMBER: 2080010B				1
PLOT: 1=1				REV.



Project scope of work

- Replace the existing control building with a larger control building
- Replace and expand existing fence to accommodate new control building
- Maintenance related improvements
 - Replace the protection and control system
 - Replace and increase the size of the A and B battery systems
 - Replace (2) 46 kV SF6 breakers with 72kV vacuum breakers
 - Replace (1) 115 kV SF6 breaker and (1) 115kV oil circuit breaker with possibly 145 kV vacuum breakers
 - Replace (2) 115 kV and (3) 46 kV disconnect switches
 - Remove (2) 115 kV grounding switches
 - Install monitoring systems on power transformer and circuit breakers
 - Replace Line and Bus VTs
 - Replace 2 pier foundations
 - Upgrade the Oil Containment system and site drainage
 - Replace control cable system
 - Replace 115 kV lightning arrestors, 115 kV and 46 kV insulators and ground grid
 - Update security systems

Project Schedule

- Seek Board of Directors approval in June 2022 to file a 248 CPG application
 - File 248 CPG application in August 2022
 - Perform PCB contamination remediation in March 2023
 - Anticipate receiving CPG in April 2023
 - Begin construction in April 2023
 - Commission substation in March 2024
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- Estimated Cost:
 - \$14.4M with 50% contingency
 - \$1.2M GMP Exclusive Cost in GMP FY2024