F206 Asset Condition Project

VSPC Geographical Targeting Subcommittee

6/30/2026

Outline

- Background Information
- Project Needs and Drivers
- Solution Alternatives
- Selection of Preferred Solution
- Schedule and Contact Information

Background Information

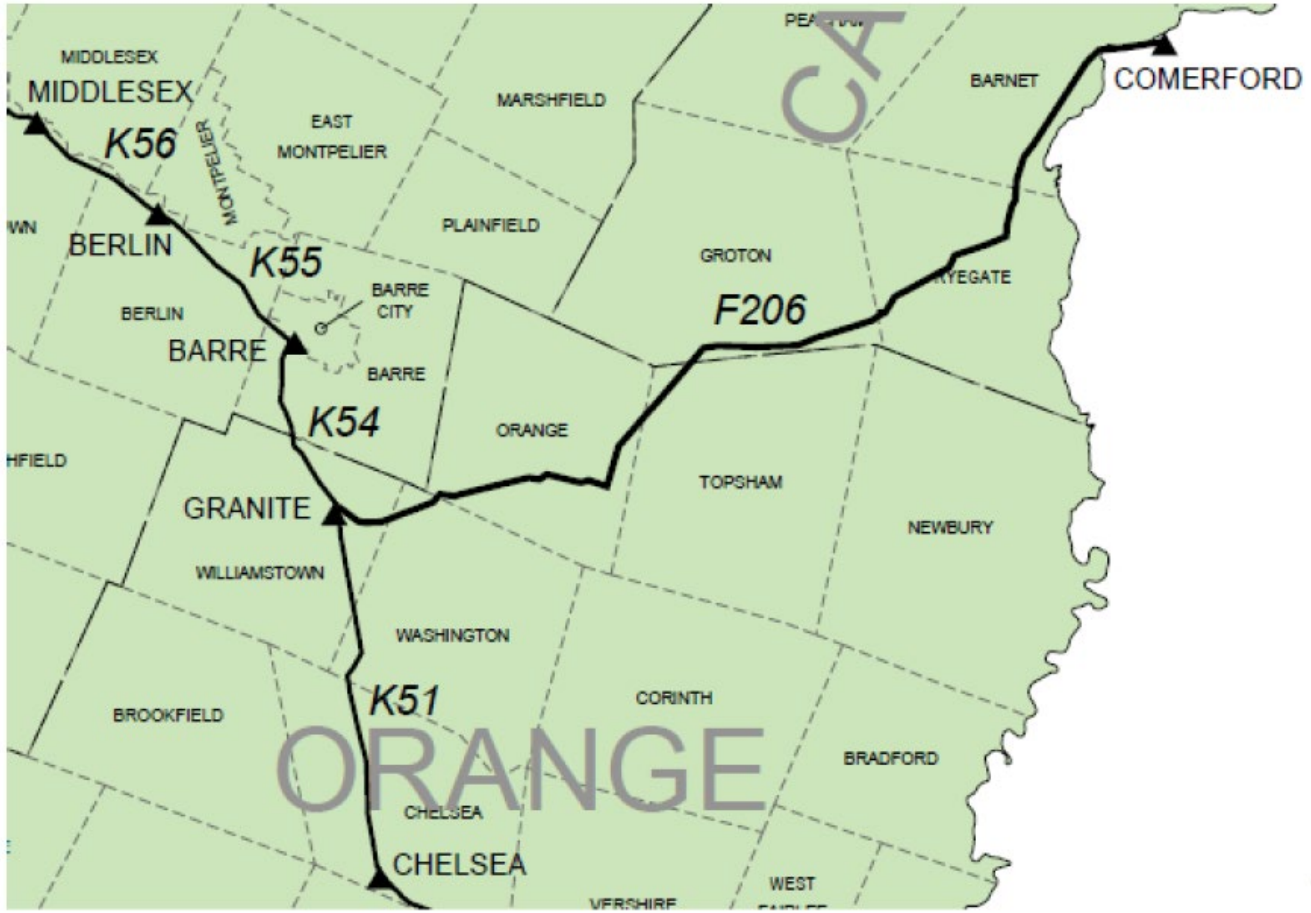
F206 Line

Key Details	
Location	**From:** Granite Substation, Williamstown, Vermont **To:** Comerford Substation, Monroe, New Hampshire
Line length	32.49 miles to Comerford
Operating Voltage	230 kV
Age and upgrade history	• Originally constructed in 1971 • No significant upgrades or rebuilds, but various structures replaced between 2007 and 2023 due to major deficiencies. Built at 230kV.
Prior PAC presentations	• None

Existing Structures			
Material	Configuration	Number	Avg. age
F206			
Wood	H-frame & Angle Structures	203	50 years
Steel	H-frame & Angle structures	74	10 years

Existing Conductor		
Type	Length	Avg. age
F206		
927 ACAR	32.10 miles	55 years
954 ACSR	0.39 miles	55 years

Background Information
F206 Location



Project Needs and Drivers

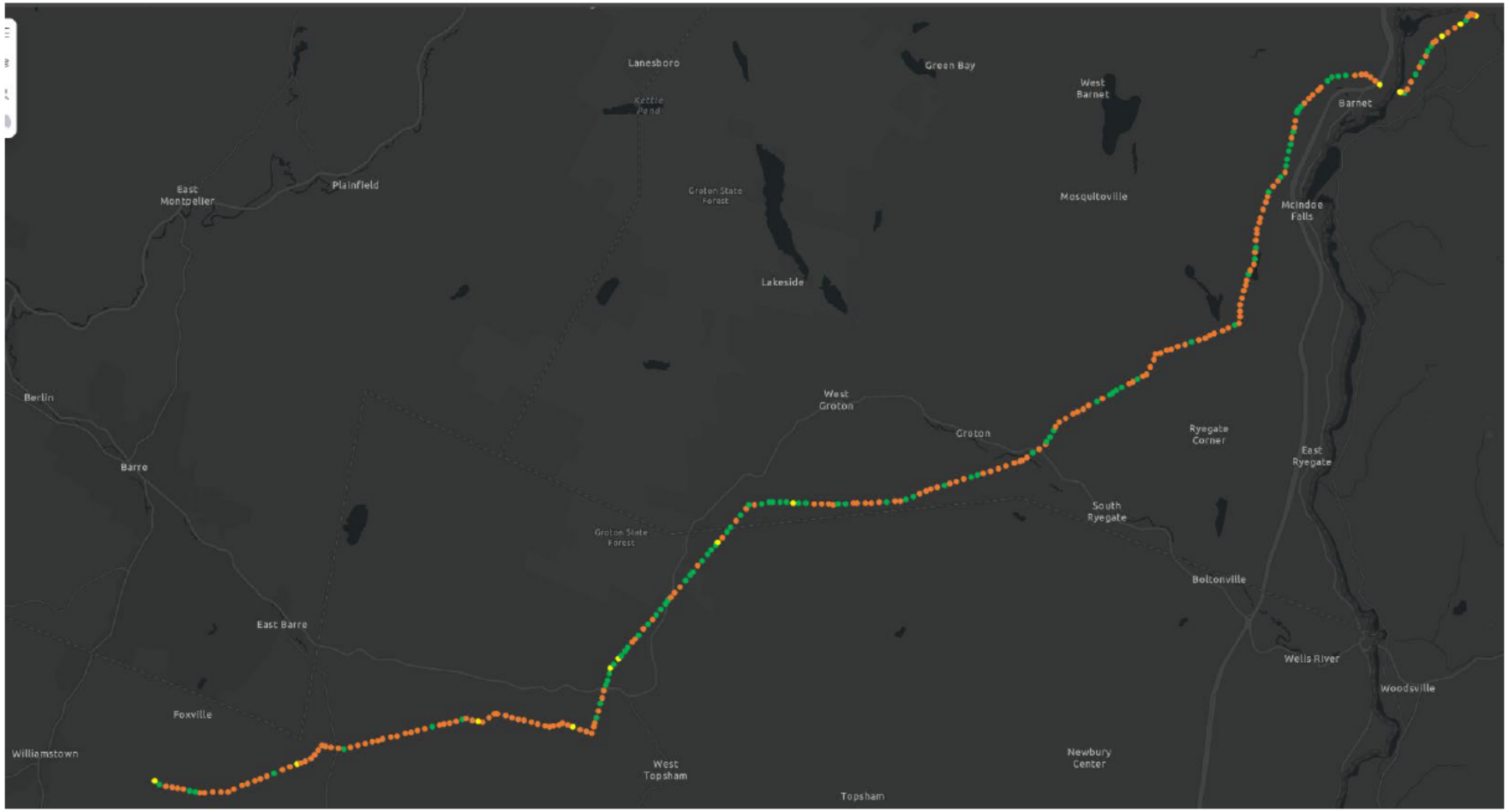
Structure Concerns

Structure Concerns	
Primary Concerns	
Wood structure rot and decay	• Recent inspections performed in 4 years have identified 181 wood structures with woodpecker damage, pole top rot, cracked crossarms, splitting poles, and other forms of decay • These structures must be replaced to maintain reliability and ensure ongoing integrity of the line • Affected structures average 55 years old and are reaching the end of the typical useful life for 230 kV natural wood structures (60 years)
Secondary concerns	
None	

Summary of Current Structure Grades		
Category	**Recommended Action**	**Number of structures**
A	No replacement required due to deterioration	83
B	Consider replacement in conjunction with other structure replacements	13
C	Initiate planned structure replacement project or Replace as part of upcoming structure replacement project	181
D	Replace immediately (emergency replacement)	0
Total		277

Background Information

F206 - Power BI Structure Condition Heat Map



Structure Rating

- A - no replacement required
- B - consider replacement in conjunction with other structure replacements
- C - initiate planned structure replacement project or replace as part of upcoming structure replacement project

Project Needs and Drivers

Structures – decay and deterioration on original 1971 poles

Project Needs and Drivers

Structures – decay and deterioration on original 1971 poles

Project Needs and Drivers

Items Not of Concern on this Line	
Issue	**Status**
Conductors	No reported issues with the conductors
Insulators	Existing porcelain insulators do not have reported issues, but would be replaced with toughened glass during structure replacements since they are of the same vintage as the structures.
Shield Wire	No reported issues with the main shield wires
Telecommunication	No reported issues with the ADSS fiber optic communication line

Review of Additional Needs

Recent Transmission Studies
Was this line overloaded in recent Attachment K studies (Reliability Needs Assessments, Longer-Term Transmission Studies, etc.) or other recent studies?
The F206 is slightly overloaded in the 2035, 2040, and 2050 cases of the 2050 study. This project also supports the high likelihood needs identified in the 2050 Study for NW Vermont.
Have modifications or upgrades to this line been identified as potential solutions in any of those studies?
No

Solution Alternatives

Alternative 1

Replace deficient 230 kV wood structures with 230 kV steel structures	
Description	Replace deficient 230 kV wood H-frame structures with 230 kV steel H-frame structures
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	$66.9M (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None - Alternative design is similar to existing design

Solution Alternatives

Alternative 2

Replace deficient 230 kV wood structures with 345 kV steel structures	
Description	Replace deficient 230 kV wood H-frame structures with 345 kV steel H-frame structures and 230 kV toughened glass insulation. Additional insulation will be added at these structures if the line is reconductored for 345 kV capacity.
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	$67.5M (no CPG); $71.6M (w/CPG) (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None - other than sizing the replacement structures to operate at a higher future voltage, alternative design is similar to existing design

Solution Alternatives

Alternative 3

Complete line rebuild and reconductor to 345kV standards	
Description	Replace all structures on the line with 345 kV steel H-frame construction and reconductor with double-bundled 954 ACSS
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	$239.2M (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None - other than sizing the line to operate at a higher future voltage, alternative design is similar to existing design

Comparative Analysis of Alternatives

Comparison			
Key Criteria	Alternative 1	Alternative 2	Alternative 3
Addresses Primary Need(s)	Yes	Yes	Yes
Secondary Needs Addressed	None	Eliminates the need to replace the same structures in the future if a line upgrade to 345 kV is required.	Sets the complete F206 line segment up to be able to operate at 345 kV if required in the future.
Cost	$66.9M	$67.5M (no CPG); $71.6M (w/CPG)	$239.2M
Constructability concerns or advantages	None	None	None
Siting, Environmental and regulatory issues	Environmental permitting required.	Environmental permitting required. Possible CPG required.	Environmental permitting and CPG required.
[Expand table as needed]			

Conclusions

- Alternative 2 is the preferred solution
- This alternative was selected because while replacing structures, it is a minimal additional cost to upgrade to 345 kV capable structures. The 2050 study outlines a high likelihood concern that would require increased capacity into the Essex area. It is far too expensive to rebuild the entire line to 345 kV prior to the need, but these upgrades will make that future more cost approachable when the need arises.

Project Timeline

- Start of engineering – Q3 2027
- Permitting – 2028
- Procurement of long lead-time material – Q1 2029
- Start of construction – Q2 2030
- Project in-service – Q4 2033

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: F206 Line Asset Condition Structure Replacements

Date of analysis: June 30, 2026

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 ❑
   b. Maintenance-related, addressing asset condition, operations, or safety; or ■
   c. Addressing transmission performance, e.g., addition of high-speed protection or a switch to sectionalize a line; or ❑
   d. Needed to address stability or short circuit problems;[1] or ❑
   e. Other technical reason why NTAs are impracticable. *Attach detailed justification that must be reviewed by the VSPC.* ❑

   If any box above is checked, project screens out of full NTA analysis.

2. What is the proposed transmission project's need date? Not applicable

   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.

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

   If so, check "yes" and continue to question 5; otherwise, check "no" and discontinue the NTA screening.

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 so, check "yes" proceed to define the scope and timing of non-transmission alternative analysis.

Sign and date this form.

This analysis performed by: Marc Allen, Senior Transmission Planning Engineer
Print name & title

VELCO
Company

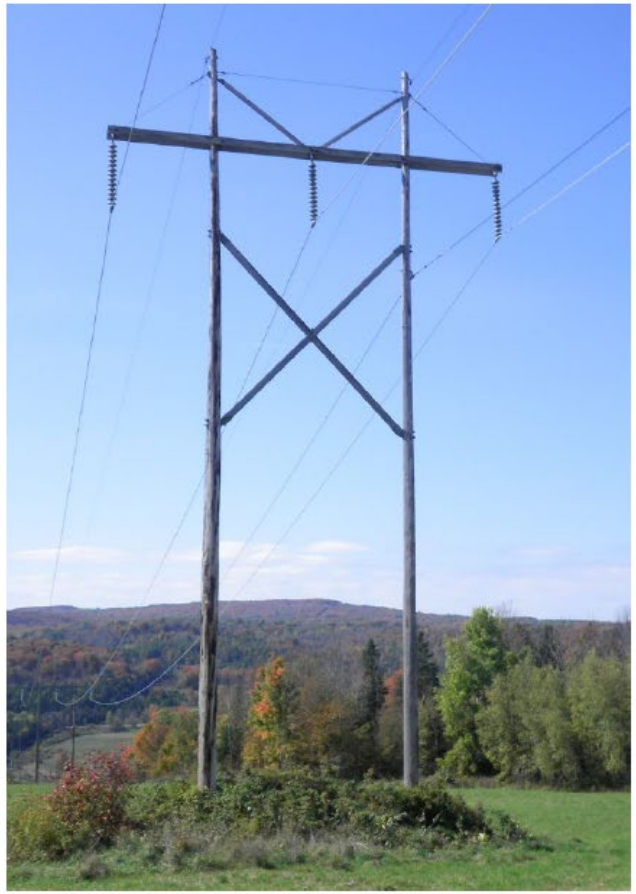
June 30, 2026
Date

Marc Allen
Signature

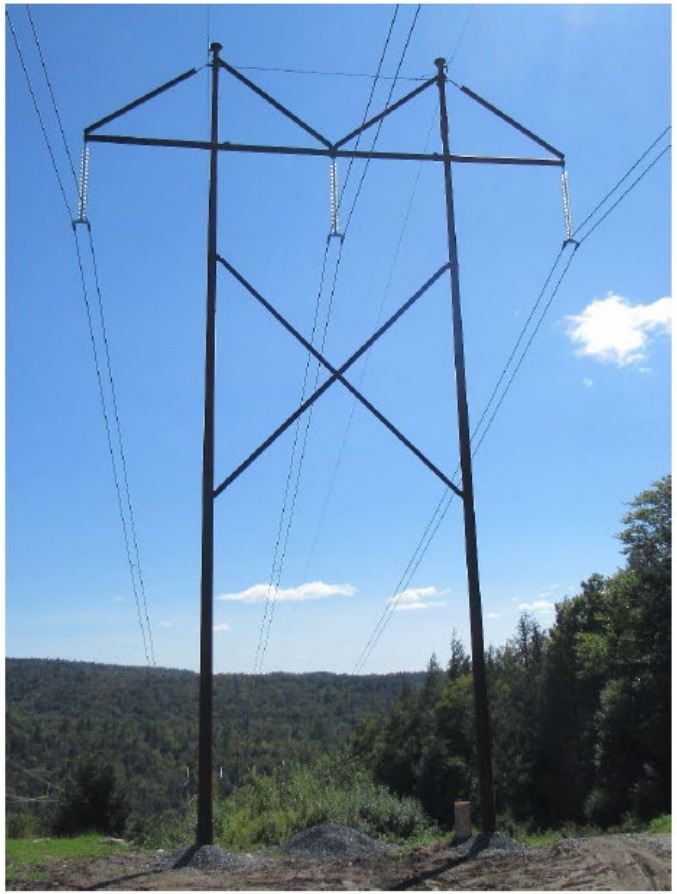
VELCO

Preferred Solution Information

Side-by-side comparison of 230 kV H-frame and 345 kV H-frame construction



230 kV H-frame



345 kV Steel H-frame