K19 Line Structure Replacement

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Planning Advisory Committee Meeting
10/23/24

Project Summary

Project Drivers
Asset condition need for direct replacement for 41 degraded 115kV structures

Alternatives Considered		
Alternative	**Description**	**Cost Estimate**
Alternative 1	Base Alternative is to replace the 41 degraded structures with 33 direct-embedded steel structures and 8 wood structures. Wood structures are being installed in select locations to use up existing wood pole inventory.	[$5.8 M]
Alternative 2	None	

Preferred Alternative		
Alternative	**Reason for Recommendation**	**Cost Estimate**
Alternative [X]	• Alternative 1 is the least cost solution and addresses the asset condition need.	[$5.8 M] -10%/+10%

Outline

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

Background Information

Line K19

Key Details	
Location	**From:** Georgia substation, Georgia, VT **To:** Sand Bar, Milton , VT
Line length	8.88 miles
Operating Voltage	115 kV
Age and upgrade history	• Originally constructed in 1975 • [No significant upgrades or rebuilds]
Prior PAC presentations	• None

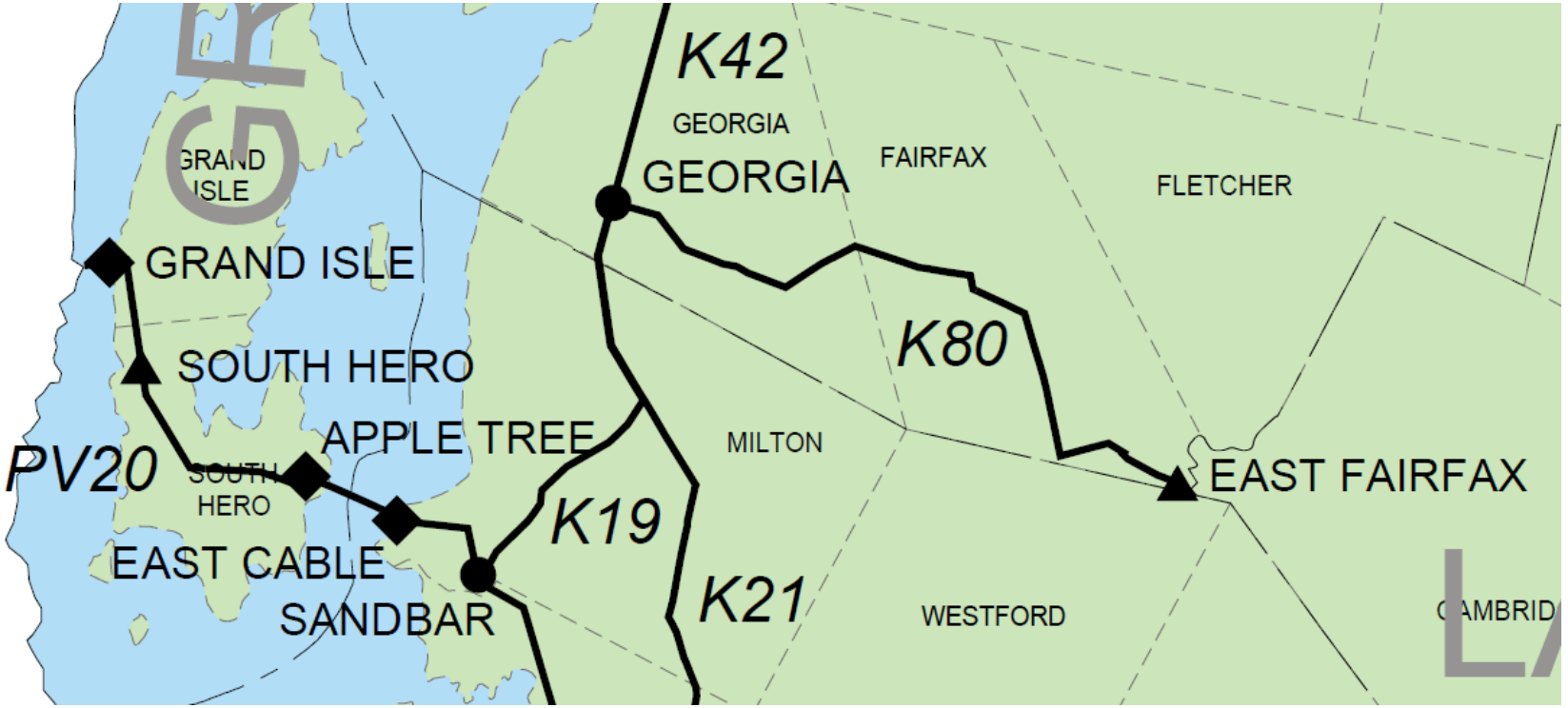
Existing Structures			
Material	Configuration	Number	Avg. age
[Line Section 1]			
[Wood]	[H-frame & Angle Structures]	93	49 years
[Steel]	[H-frame & angle structures]	0	
[Steel]	[Single-circuit lattice tower]	0	

Existing Conductor		
Type	Length	Avg. age
K19		
927 ACAR	8.88 miles	49 years

Background Information

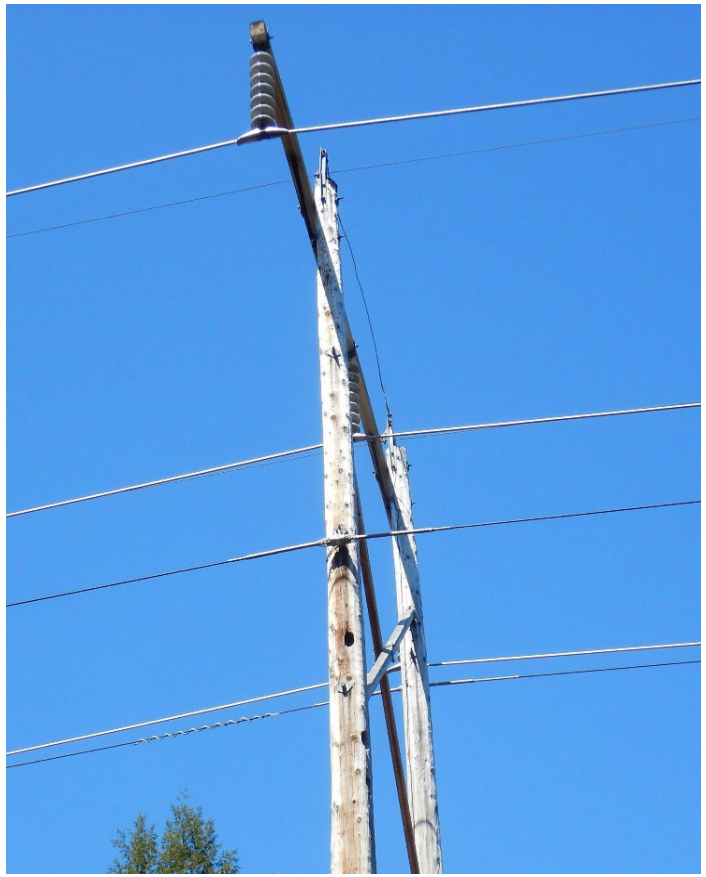
Maps and Diagrams

K19 Line (115kV from Sandbar to Georgia)

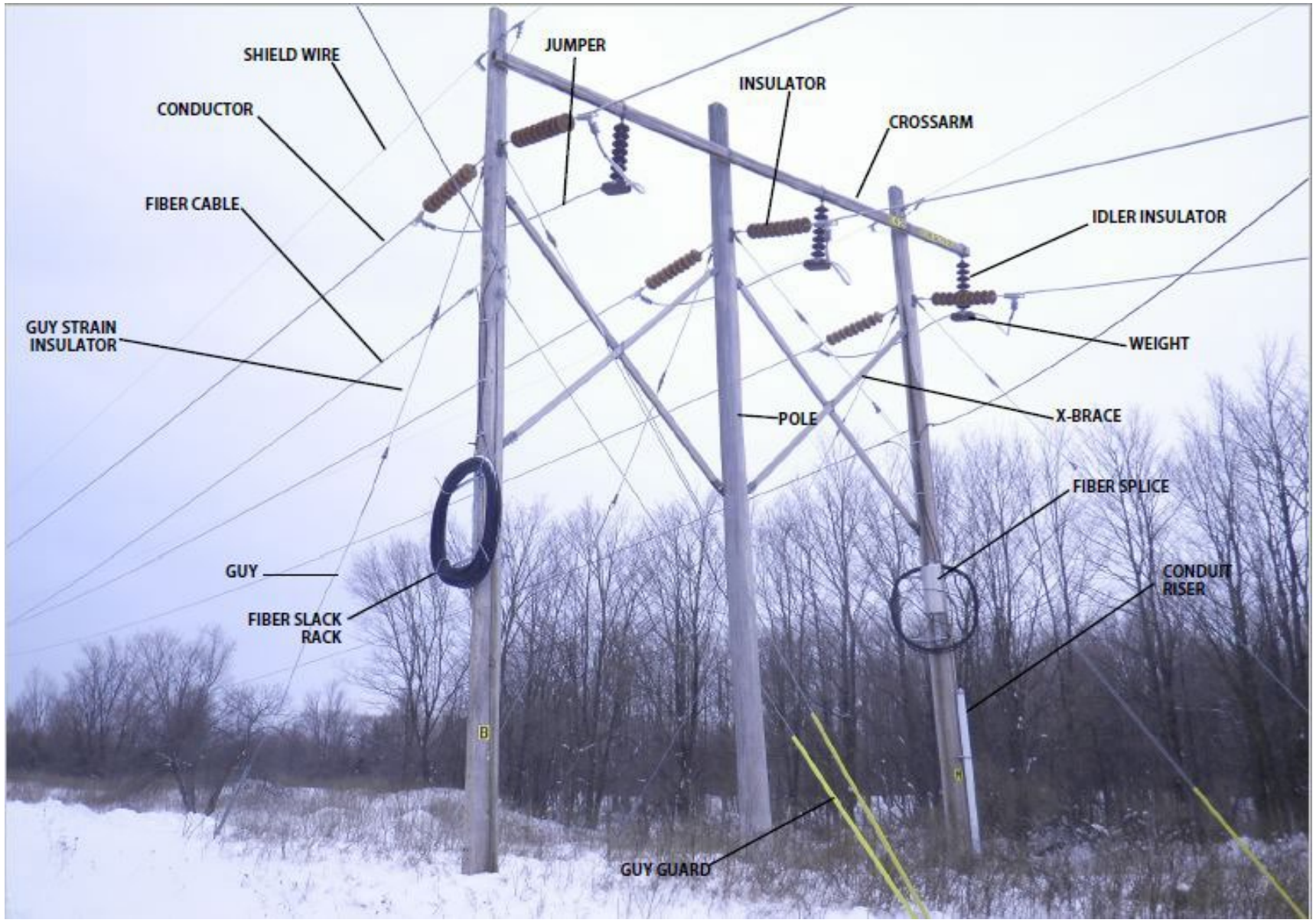


K19 Line Structure Replacement Summary

- Located in variable lowland terrain with large wetlands and challenging side slopes
- Major issues being addressed include significant woodpecker damage, internal pole voids, and rotten pole tops
- Additional assessment findings include severely weathered and cracked poles
- Replace 41 out of 93 wood H-frame structures. Majority of replacements will be with steel H-frames, including the southern section of the line where the woodpecker damage is located. Minimal wood H-frames will be installed to reduce wood pole inventory.
- 15 structures are rated D, 22 structures are rated C and 4 structures are rated B
- Extensive matted roads are required to reach many of the D and C rated structures. These temporary roads will pass by the B rated structures. Replacement of the B rated, 50 year old structures is occurring to avoid having to re-incur the significant matting costs for the temporary roads.
- Total Estimate: $5.8 million PTF
- Completion of work projected in 2025



Structure parts defined



Project Needs and Drivers

Structure Concerns

Structure Concerns	
Primary Concerns	
Wood structure rot and decay	• Recent inspections performed in 2020 and 2021 have identified 41 of 93 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 49 years old and are reaching the end of the typical 60 year useful life for 115kV natural wood structures.
Steel lattice structure deterioration	• No steel structures identified
Secondary concerns	
None	

Summary of Current Structure Grades			
Category	Recommended Action	Number of Total structures	Number of structures replaced
A	No replacement required due to deterioration	34	0
B	Consider replacement in conjunction with other structure replacements	22	4
C	Initiate planned structure replacement project **or** Replace as part of upcoming structure replacement project	22	22
D	Replace immediately (emergency replacement)	15	15
Total		**93**	**41**

Project Needs and Drivers
Pole Rot

Project Needs and Drivers
Weathered Poles and Woodpecker holes

Project Needs and Drivers
Cracked poles

Project Needs and Drivers

Items Not of Concern on this Line	
Issue	**Status**
Structures	41 structures identified in need of direct replacement with steel or wood structures.
Conductors	927 ACAR conductor on this line section. Condition is adequate.
Insulators	Insulators on 41 structures will be replaced as part of this project.
Shield Wire	Condition of shield wire is adequate at this time.
Telecommunication	Line has All Dielectric Self Supporting(ADSS) fiber optic cable.
Planning	No short term planning needs identified at this time.
Operational	No operational needs identified at this time.

Review of Relevant Transmission Studies

Recent Transmission Studies
Was this line overloaded in recent Attachment K studies (Reliability Needs Assessments, Longer-Term Transmission Studies, etc.) or other recent studies?
No overloads identified in any recent studies
Have modifications or upgrades to this line been identified as potential solutions in any of those studies?
None

Evaluated Solution Alternatives

[Alternative Number]

[Alternative Name]	
Description	[Direct replacement of 41 wood structures with 41 direct buried steel or wood structures.
Primary Needs Addressed	Structure degradation
Secondary Needs Addressed	No secondary needs identified
Advanced transmission technologies to be considered	No advanced technologies considered
Cost Estimate and Accuracy	$5.8M (+10% / -10%)
Impact on transmission needs or concerns from recent studies	No impact from recent studies
Key standards or criteria affecting design if different than current design	Design is similar to existing design

Comparative Analysis of Alternatives

Comparison			
Key Criteria	**Alternative 1**	**Alternative 2**	**Alternative 3**
Addresses Primary Need(s)	Yes	None considered	
Secondary Needs Addressed	None		
Cost	$5.8M		
Constructability concerns or advantages	None		
Siting, Environmental and regulatory issues	None		

Conclusions

- The least cost solution is to replace the degraded structures with wood and direct embed steel structures.
- Alternative 1 is the preferred alternative

Schedule

Planned Schedule	
Comment Deadline	November 23, 2024 Please submit any comments to pacmatters@iso-ne.com and fettori@velco.com
Follow-up PAC Presentation	None planned
Start of Major Construction	Q2 2020
Project in Service	Q2 2025