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New Hampshire Asset Condition Structure Replacements – Line T198

Planning Advisory Committee Meeting

July 23, 2025

Outline

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

Project Summary

Project Drivers

- Inspections have identified multiple structure concerns including woodpecker damage, pole top rot, pole top splits, checking through insulator/equipment connections, and other forms of decay

Alternatives Considered

Alternative	Description	Cost Estimate
Alternative 1	Base Alternative, replace all structures requiring immediate replacement	$17.479 M (-50%, +200%)
Alternative 2	Same as Alternative 1, plus proximity structures	$24.431 M (-25%, +50%)

Preferred Alternative

Alternative	Reason for Recommendation	Cost Estimate
Alternative 2	• Replace 48 total wood structures: 25 C structures, 3 uplift, 20 proximity B structures, and remove 2 wood structures (due to seasonal flooding) • Alternative 2 minimizes future disturbances to the ROWs and avoids near-future project cost to replace original wood structures in close proximity to planned work sites	$24.431 M (-25%, +50%)

Background Information

Line T198

Key Details	
Location	**From:** Emerald Street Substation *Keene, NH* **To:** Monadnock Substation *Troy, NH*
Line Length	11.2 miles
Operating Voltage	115 kV
Age and Upgrade History	• Originally constructed in 1962 • Several structure replacements in recent years
Prior PAC Presentations	• ACL 323: 2021 Presentation

Existing Structures

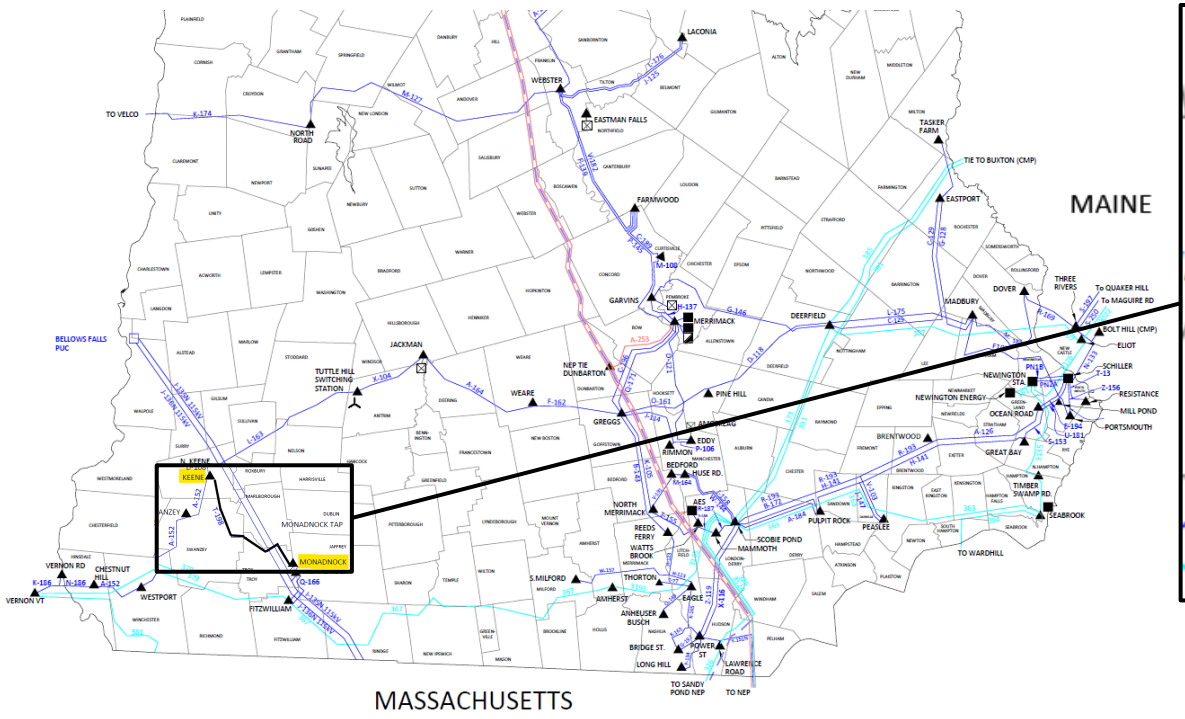
Material	Configuration	Number	Avg. age
Wood	Single-circuit H-frame	87	63 years
Steel	Single-circuit H-frame	58	3 years
Steel	3-Pole	9	3 years

Existing Conductor

Type	Length	Avg. age
477 ACSR	11.2 miles	63 years

Project Location

New Hampshire Map



Project Needs and Drivers

Structure Concerns

Structure Concerns	
Primary Concerns	
Wood structure deterioration	• Recent inspections performed in 2024 have identified 25 wood structures with woodpecker damage, pole top rot, pole top splits, checking through insulator/equipment connections, and other forms of decay • These structures must be replaced to maintain reliability and ensure ongoing integrity of the line • Three Category B structures must be replaced due to uplift issues • Two Category B original wood structures will be removed due to seasonal flooding concerns • Affected structures are on average 63 years old and are reaching the end of the typical useful life for 115 kV natural wood structures (40 – 60 years)
Secondary Concerns	
Category B structures	• Category B structures are in close proximity to the work sites that will be required to replace the Category C structures

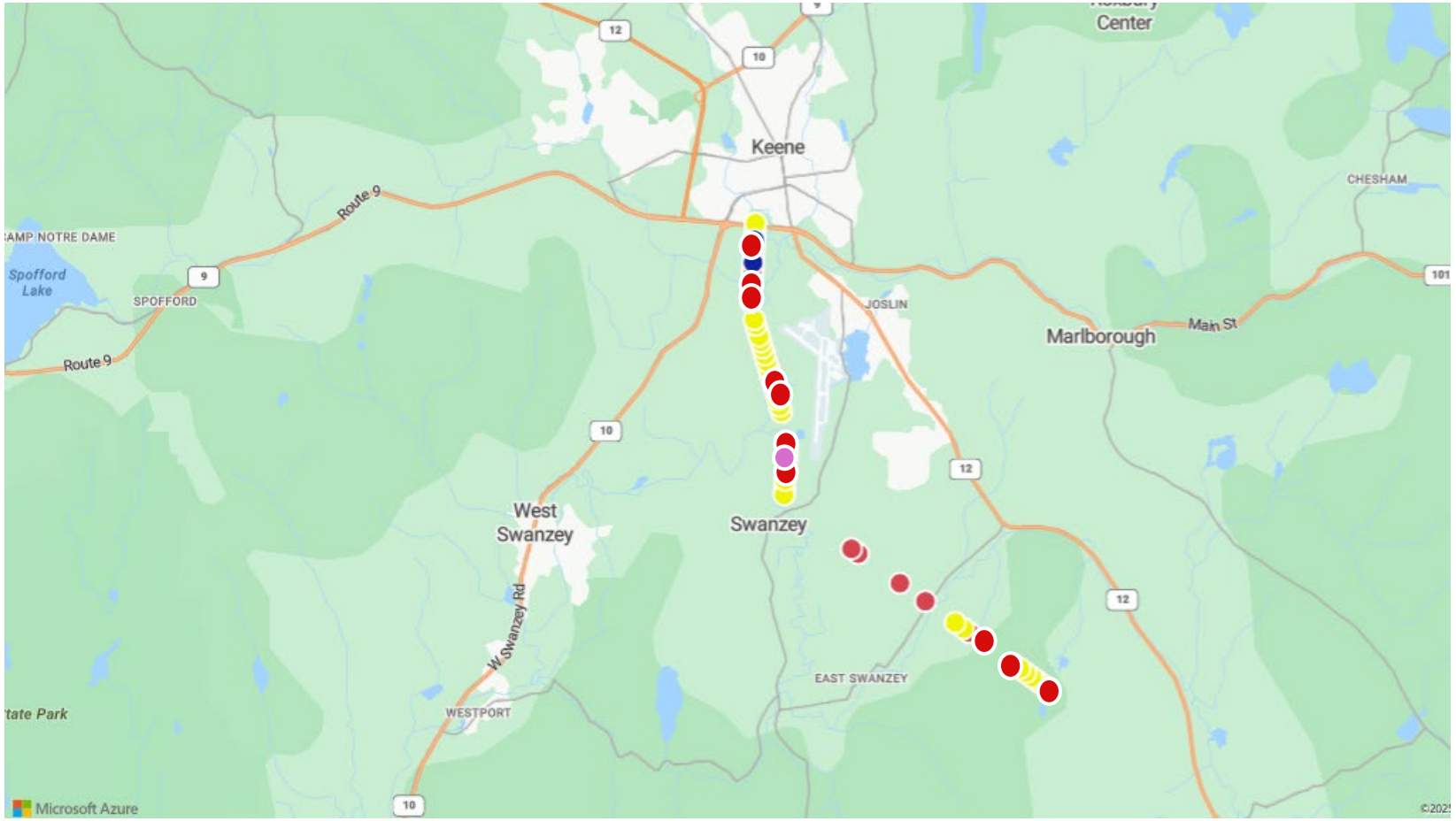
Summary of Current Structure Grades		
Category	**Recommended Action**	**T198**
A*	No replacement required due to deterioration	67
B	Consider replacement in conjunction with other structure replacements	61
C**	Initiate planned structure replacement project **or** Replace as part of upcoming structure replacement project	26
D	Replace immediately (emergency replacement)	0
Total		**154**

- *Newer steel structures were rated both A and B, in the latest inspections under Eversource's rating guidelines. All are listed as Category A here because no replacements are expected to be necessary due to deterioration for the foreseeable future*

** *One C-rated structure to be replaced in coordination of the Monadnock Substation Rebuild Project, ES-23-LSP-132*

Project Needs and Drivers

Structure Concerns – Map (Line T198)



- Category C structures
- Proximity structures
- Uplift
- Removal

Project Needs and Drivers

Structure Concerns

Line T198
Structure 119
Pole top rot, checking through crossarm attachment

Line T198
Structure 133
Large splits through top and hardware

Project Needs and Drivers

Other Concerns

Other Concerns	
Conductors	• No needs identified at this time
Insulators	• No needs identified at this time
Shield Wire	• No needs identified at this time
Planning	• No needs identified at this time
Operational	• No needs identified at this time
Telecommunication	• No needs identified at this time

Review of Relevant Transmission Studies

Transmission Study Status
Was this line overloaded in recent Attachment K studies (Reliability Needs Assessments, Longer-Term Transmission Studies, etc.) or other recent studies?
• The most severe overloads documented outside of Winter Peaking 57 GW scenario were in the 51 GW Winter Peaking scenario   • Line T198, 119.3% at 267 MVA Loading over current LTE Rating of 224 MVA
Have modifications or upgrades to this line been identified as potential solutions in any of those studies?
No

Evaluated Solution Alternatives

Alternative 1

Base Alternative	

Description	• 28 total structure replacements and 2 structure removals
	  • Replace the 25 Category C structures
	  • Replace 3 uplift Category B wood structures
	  • Remove 2 original wood Category B structures (due to seasonal flooding)
	  • *To accommodate these removals the 1,154-foot span will be reconductored with 1272 ACSS at 12k tension*

Primary needs addressed	• Yes, Category C structure concerns are addressed
Secondary needs addressed	• No
Advanced transmission technologies to be considered	• None • No advanced transmission technologies are applicable to degraded structures
Cost estimate and accuracy	• **Line T198 – $17.479 (-50%, +200%)**
Longer-term transmission needs addressed	• N/A
Key standards or criteria affecting design if different than current design	• New structures will be steel H-frame and 3-pole structures designed in accordance with the current NESC requirements

Evaluated Solution Alternatives

Alternative 2

Base Alternative, Plus Proximity Structures	

Description	• 48 total structure replacements and 2 structure removals
	  • Replace the 25 Category C structures
	  • Replace 3 uplift Category B wood structures
	  • Remove 2 original wood Category B structures (due to seasonal flooding)
	  • *To accommodate these removals the 1,154-foot span will be reconductored with 1272 ACSS at 12k tension*
	  • Replace 20 Category B proximity original wood structures due to permitting and its location along the access route and work area

Primary needs addressed	• Yes, Category C structure concerns are addressed
Secondary needs addressed	• Yes, Category B proximity structure concerns are addressed
Advanced transmission technologies to be considered	• None • No advanced transmission technologies are applicable to degraded structures
Cost estimate and accuracy	• **Line T198 – $24.431M (-25%, +50%)**
Longer-term transmission needs addressed	• N/A
Key standards or criteria affecting design if different than current design	• New structures will be steel H-frame and 3-pole structures designed in accordance with the current NESC requirements

Comparative Analysis of Alternatives

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Comparison

Key Criteria	Alternative 1	Alternative 2
Addresses primary need	Yes	Yes
Addresses secondary need	No	Yes (Proximity structures)
Cost	• **Line T198 – $17.479 (-50%, +200%)**	• **Line T198 – $24.431M (-25%, +50%)**
Constructability concerns or advantages	Good – no unusual problems anticipated	Good – no unusual problems anticipated
Siting, environmental and regulatory issues	• Resolves immediate structure issues but does not minimize repeated future disturbances within the same section of the ROW by leaving Category B structures located in close-proximity to the work sites	• Minimizes repeated near-future disturbances within the same section of the ROW by replacing the Category B structures located in close-proximity to the work sites

Conclusion

- Total access costs to support this project is estimated to be $7.7 M
  - The right of way contains challenges impacting the access cost, such as rugged terrain, wetlands, floodplains, and multiple crossings of the Ashuelot River
  - Taking advantage of a single mobilization effort creates cost efficiencies in access as well as engineering, siting, permitting, and project management efforts
- Under Alternative 1, the average cost per structure replacement/removal is $582k
- Under Alternative 2, the incremental cost to replace proximity structures is approx. $347k per structure
- Alternative 2 is the preferred solution

Schedule

Planned Schedule	
Start of Major Construction	Line T198 - Q4 2025
Project in Service	Line T198 – Q4 2026

Comment Submission	
Comment Deadline	August 7, 2025
ISO-NE Contact Email Address	pacmatters@iso-ne.com
Transmission Owner Contact Name	Dave Burnham
Transmission Owner Contact Email Address	PAC.Responses@eversource.com

Questions