

NH Line Asset Condition Projects

Planning Advisory Committee Meeting

March 16, 2023

Agenda

- Project Background
- Project Locations
- Project Drivers
- Project Scopes
- Summary

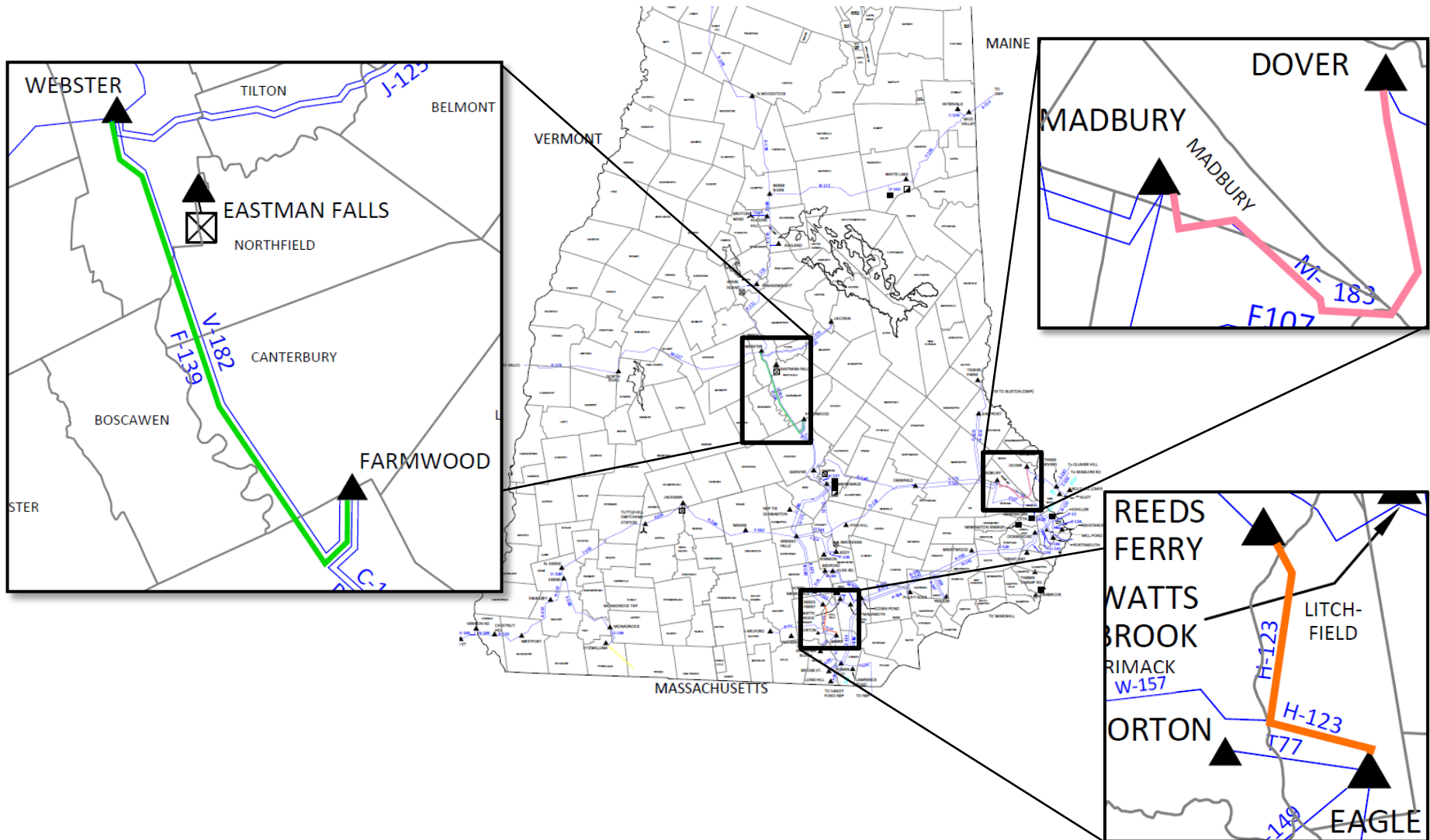
Project Background

- 115 kV F-139 line spans between Farmwood and Webster substations
 - 192 structures; combination of wood and steel structures
 - Total line length: 14.7 mi

- 115 kV M-183 line spans between Dover and Madbury substations
 - 91 structures; combination of wood and steel structures
 - Total line length: 6.89 miles

- 115 kV H-123 line spans between Eagle and Reeds Ferry substations
 - 57 structures; combination of wood and steel structures
 - Total line length: 3.87 miles

Project Locations

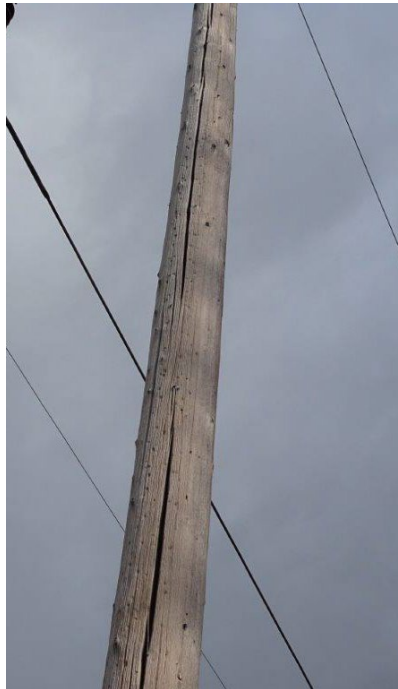


Wood Structure Asset Condition

- Many existing wood structures on the F-139, M-183 and H-123 lines have one or more of the following deficiencies:
 - Woodpecker damage, pole top rot, split pole top, decay
- Other structures do not meet current Eversource design standards for structural capacity, uplift and clearance



Line F-139 Structure 197
Significant Rot, Split Pole Top



Line H-123 Structure 188
Split Pole



Line M-183 Structure 1
Pole Top Rotted and Split

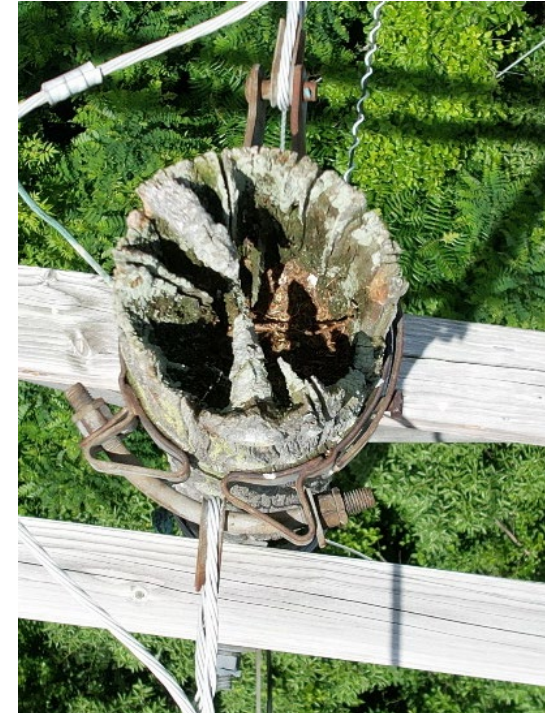
Wood Structure Asset Condition



Line F-139 Structure 191
Decay, Woodpecker Damage



Line M-183 Structure 19
Splitting and Pole Top Rot



Line M-183 Structure 83
Pole Top Rot

Project Driver – Optical Ground Wire (OPGW)

- OPGW will be installed on the F-139 & H-123 lines in conjunction with structure replacements
 - M-183 line does not have sufficient drivers to justify OPGW installation at this time
- OPGW installation expands a private Eversource OPGW / Synchronous Optical Networking (SONET) loop
 - Provides a controlled, alternate fiber communication path supporting the long-term buildout of the fiber optic network
 - Greatly reduces the reliance on leased services for protection, SCADA, and Phasor Measurement Unit (PMU) and Dynamic Disturbance Recorder (DDR) installations (ISO-NE OP-22)
 - A private network is segregated from third-party telecom services, improving the overall reliability and security of communications paths
- Critical Infrastructure Protection: Fiber provides the necessary bandwidth for physical security monitoring and triaging of alarms for BES Cyber Systems at medium and low impact substations
- The DOE and EPRI recommend fiber as a means to strengthen the security and resilience of critical communication infrastructure to protect against the consequences of electromagnetic pulse attacks
- Fiber optic cable is a non-propagating media for electric and magnetic fields and therefore is considered generally immune to the effects of geomagnetic disturbances

Project Drivers – M-183 & H-123

- Limited structure replacements are required on the M-183 and H-123 lines
 - Structure asset condition issues
 - Structure capacity and uplift concerns
 - M-183 structure replacements require additional civil work due to above average rock concentrations
- OPGW will be installed on the H-123 line to expand the Eversource communications network
 - Provides communications path between Eagle and Reeds Ferry substations
 - Allows for future communications network expansion westward

Project Drivers – F-139 Conductor Replacement & Reliability

- Based on recent inspections, all remaining wood structures on F-139 line need to be replaced
 - Wood structures were installed in 1966 (57 years old)
- Existing 795 kcmil ACSR conductor installed on F-139 line is 65 years old
 - Life expectancy of ACSR is between 65-67 years
- Addressing numerous asset condition structure issues along this line presents an opportunity to carry out a more comprehensive rebuild to current engineering standards and growing transmission needs
 - Robust, long-term solution for system reliability
 - Allows for more efficient procurement and utilization of resources, as well as more efficient siting and permitting
 - Reduces the occurrence of unplanned outages which may require the need for emergency structure replacement
 - Utilizes Eversource standard structures, conductor, and OPGW to replace structures and shield wires

Project Scopes

- F-139 line
 - Replace remaining 144 wood structures with 142 steel H-frame structures
 - Reconductor 14.45 mi of 795 ACSR with 1272 ACSS
 - Remaining 0.25 mi of conductor is 1590 ACSR installed in 2014/2015
 - Replace 2 runs of Alumoweld shield wire with OPGW, 29.4 miles total
 - Install ADSS into Farmwood and Webster substations to tie in OPGW
- M-183 line
 - Replace 9 wood three-pole structures with 9 light duty steel three-pole structures
 - Replace 12 wood H-frame structures with 12 light duty steel H-frame structures
- H-123 line
 - Replace 7 remaining wood structures on the line with 7 steel H-frame structures
 - Replace 2 runs of Alumoweld with 2 runs of OPGW, 6.9 miles total
 - 2 runs from Reeds Ferry to W-157 Junction with 1 continuing to Eagle substation
 - Install ADSS into Reeds Ferry and Eagle substations to tie in OPGW

Summary

- F-139 line
 - Replace remaining 144 wood structures with 142 steel H-frame structures
 - Reconductor 14.45 mi of 795 ACSR with 1272 ACSS
 - Install 29.4 miles of OPGW (2 x 14.7 mi)
 - Install ADSS into Farmwood and Webster substations to tie in OPGW
 - Total Estimated PTF Cost: **\$58.0M** (-25 / +50%)
 - Project in-service date: **Q1 2025**
- M-183 line
 - Replace 21 wood structures with 21 steel structures
 - Total Estimated PTF Cost: **\$6.0M** (-25 / +50%)
 - Project in-service date: **Q3 2023**
- H-123 line
 - Replace 7 remaining wood structures on the line with steel structures
 - Install 6.9 miles of OPGW (1 x 3.8 mi, 1 x 3.1 mi)
 - Install ADSS into Reeds Ferry and Eagle substations to tie in OPGW
 - Total Estimated PTF Cost: **\$5.8M** (-25 / +50%)
 - Project in-service date: **Q4 2023**

Questions

