

Connecticut Structure Replacement & OPGW Installations - Revised

Planning Advisory Committee Meeting

July 27th, 2023

Agenda

- Project Background
- Project Location
- Project Drivers
 - Structures
 - Optical Ground Wire
- Project Scope
- Summary

Project Background

- Eversource manages ~4,000 circuit miles of overhead transmission lines
 - Nearly 40% of all transmission in New England
- Eversource takes a proactive approach to maintain long-term structural integrity and continued reliability of its transmission infrastructure through regular inspections (walkdown ground inspections, structure ground line, flyovers, etc.)
 - Recent inspections show significant signs of degradation on wood poles
- Structures targeted for replacement as part of these projects are natural wood
 - Other supporting structures on these lines were inspected and do not require any further work
- This presentation covers structure replacements and OPGW installations on one Eversource 115 kV line and two Eversource 345 kV lines in Connecticut

Project Background (Cont'd)

Line 364

- 345 kV line runs between Montville and Haddam Neck substations
- 199 structures – combination of wood, steel, and lattice
- Constructed in 1970 (53 years old)
- Total length: 22.64 miles

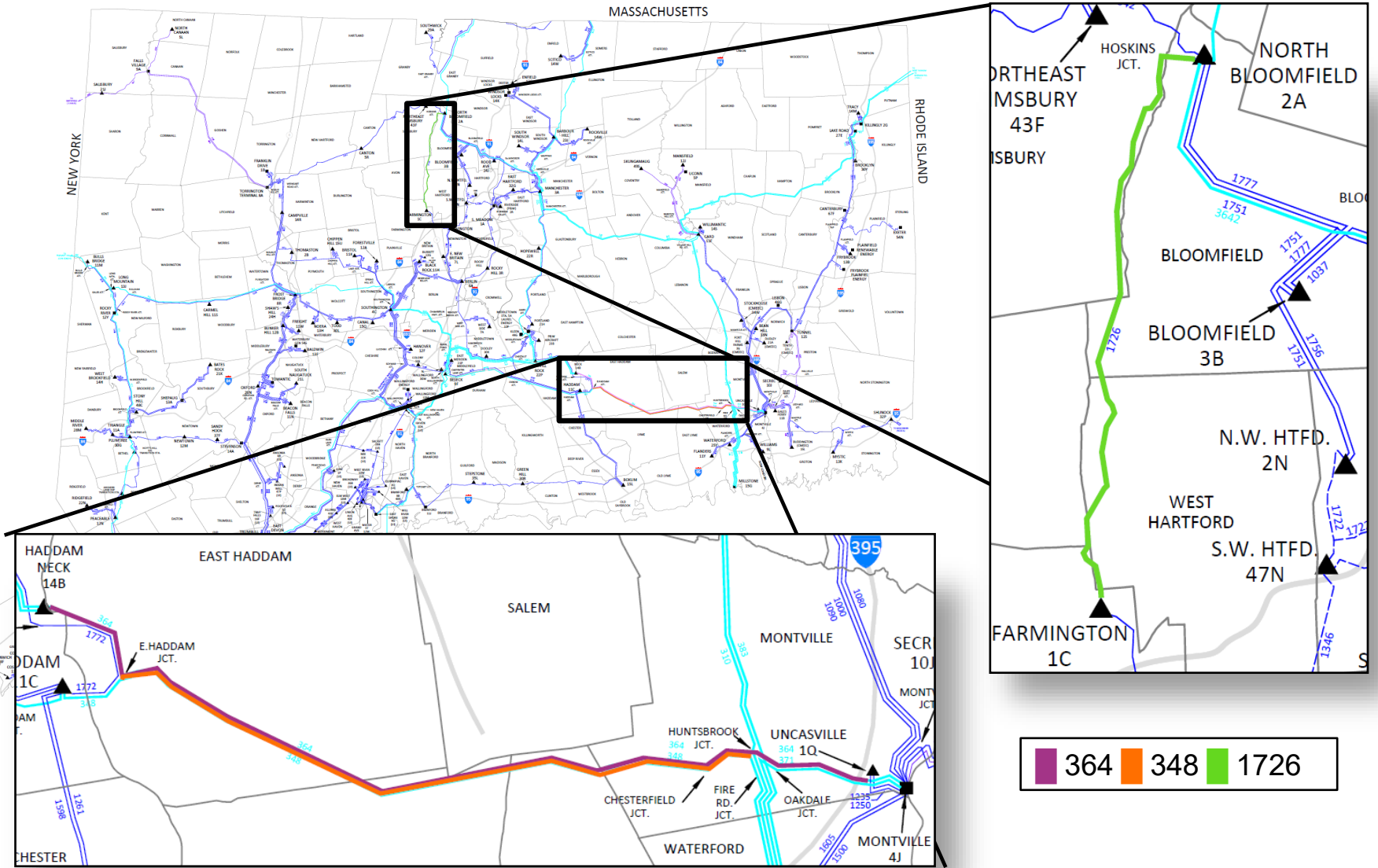
Line 348

- 345 kV line runs between Millstone and Haddam substations
- 237 structures – combination of wood and steel
- Constructed in 1974 (49 years old)
- Total length: 26.40 miles

Line 1726

- 115 kV line runs between North Bloomfield and Farmington substations
- 123 structures – combination of wood and steel
- Constructed in 1991 (32 years old)
- Total length: 11.67 miles

Project Location



Project Drivers – Structure Asset Condition

- Recently completed inspections of these lines graded condition of all structures in accordance with Electric Power Research Institute (EPRI) guidelines:
 - *A: Nominal Defect – No Action Required*
 - *B: Minimal Defect – Monitor Degradation*
 - *C: Moderate Defect – Repair or Replace under next maintenance*
 - *D: Severe Defect – Repair, Reinforce, or Replace immediately*
- Grade C and D round wood structures showed one or more of the following age-related degradations, leading to decreased load carrying capability:
 - Woodpecker damage
 - Cracking & splitting
 - Damaged insulators & deteriorated steel hardware

Project Drivers – Structure Asset Condition (Cont'd)

- Additional Grade A and B structures were identified and prioritized for replacement based on structure loading concerns or efficiencies in acquiring required permits and other approvals for replacing Grade C and D structures, as well as minimizing environmental impacts
 - Of the structures being replaced, 40% are Grade C and D and the remaining are Grade A and B
- If not addressed, these issues jeopardize the long-term integrity of the transmission system and its continued reliability

Project Drivers – Structure Asset Condition (Cont'd)



Line 364 Structure 5555
Loose Hardware



Line 1726 Structure 8084
Crossarm Cracking



Line 364 Structure 5557
Woodpecker Damage

Project Drivers – Optical Ground Wire

- Optical Ground Wire (OPGW) will be installed on all lines in conjunction with structure replacements
 - Shield wire on Lines 348, 364 and 1726 is 49, 53 and 32 years old, respectively
 - Additional structures were identified for replacement due to structural loading concerns and uplift that will result from OPGW installation
- 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

Project Drivers – Optical Ground Wire (Cont'd)

- Critical Infrastructure Protection (CIP): Fiber provides the necessary bandwidth for physical security monitoring and triaging alarms for BES Cyber Systems at medium and low impact substations
- The DOE and EPRI recommend fiber to strengthen the security and resilience of critical communication infrastructure and protect from electromagnetic pulse attacks
- Fiber optic cable is a non-propagating media for electric and magnetic fields, generally immune to the effects of geomagnetic disturbances

Project Scope

Line	kV	Length (miles)	Replacement Structures	Total Structures	OPGW Replacement Length (miles)	Estimated Cost (-25% / +50%)	In-Service Date
364	345	22.64	11	199	22.64	\$12.61M	Q3 2024
348	345	26.40	3	237	16.15	\$9.70M	Q3 2024
1726*	115	11.67	7	123	11.67	\$8.86M	Q1 2025
Totals		60.71	21	559	50.46	\$31.17M	-

* Also includes modification of ten (10) structures (addition of X-braces and guy wires)

- For all lines: Replacement of 7#8 Alumoweld shield wire with 96F OPGW

Summary

- Inspections have indicated significant degradation of several structures along the lines identified in this presentation
- Replace 21 existing wood structures with weathering light duty steel H-frame structures
 - New structures will provide a much greater life expectancy and a higher storm resiliency than wood
 - Supports long-term integrity and reliability of the Eversource transmission system
- Replace 50.46 circuit miles of existing shield wire with OPGW
 - OPGW will provide multiple benefits including:
 - Increasing the resiliency of the electric transmission system, making it more resilient to adverse weather conditions
 - Providing vital communications links between equipment

Total Estimated PTF Costs: \$31.17M (-25% / +50%)

Questions

