

Webster - Beebe River 115 kV Corridor Asset Condition and OPGW Project – Lines A111, E115 and Z180

Planning Advisory Committee Meeting

December 16, 2020

Revised

Agenda

- Project Background
- Project Location
- Project Needs
 - Wood Pole Asset Condition
 - Engineering Analysis
 - OPGW
- Project Scope
 - Alternatives
 - Preferred Solution

Project Background

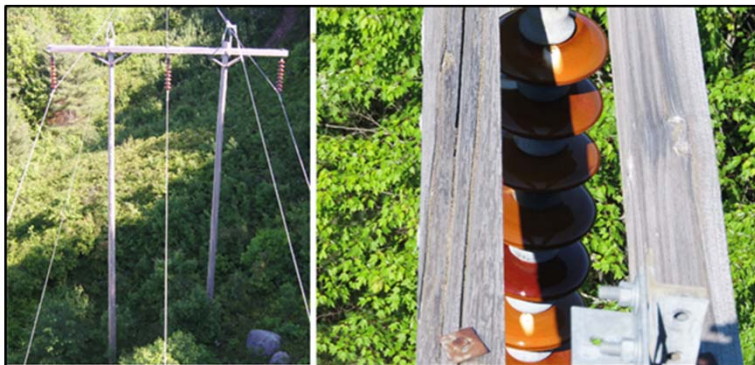
- Three 115 kV lines run between Webster and Beebe River Substations in central NH
 - Line A111 (Webster Substation – Pemigewasset Substation)
 - Line E115 (Pemigewasset Substation – Huckins Hill Substation)
 - Line Z180 (Huckins Hill Substation – Beebe River Substation)
- All three lines were originally part of the A111 Line
 - Originally constructed in 1953
 - Current conductor is predominately 336 kcmil ACSR 26/7
- All lines are supported primarily on single circuit wooden H-Frame structures
- Eversource previously presented wood structure replacement programs (Oct 2018 and Dec 2019) that focused on individual pole replacements (no conductor replacements)
 - For other lines with a high percentage of structures needing replacement, rebuilding the lines may be more cost effective

Project Needs: Wood Pole Asset Condition

- H-frame structures are deteriorating and have one or more of the following deficiencies:
 - Split pole tops and cracks
 - Woodpecker damage
 - Deteriorating steel components



A111 Structure #64 – Split pole tops, woodpecker damage, cracks



Z180 Structure #289 – Woodpecker damage, crossarm rot, cracks



E115 Structure #160 – Split pole tops, crossarm rot, shell rot, cracks

Project Needs: Engineering Analysis

- Engineering analysis identified structures which are projected to be loaded beyond their design capabilities considering the National Electrical Safety Code at the time of construction
- Age of structures (67 years) and wood deterioration must also be considered

Project Needs: OPGW

- Eversource's standard is to provide all facilities with a high-bandwidth, low latency, secure, reliable network operations. The benefits of fiber installation are as follows:
 - Future expansion of private Eversource network/systems
 - The ability to support high-speed, direct fiber relaying and grid modernization efforts
 - Ensures high reliability for communications
 - Provides bandwidth necessary for security infrastructure
- This project will provide a controlled fiber communication path supporting the long term build out initiative of the fiber optic network
- Lack of optical ground wire (OPGW) precludes high-bandwidth, low latency, secure and reliable network operations
- A private Eversource network is segregated from third-party Telecom services, mitigating accessibility to BES Cyber Systems

Project Scope: Alternatives

Full Rebuild

- Replacement of all wood structures
 - Only requires Eversource enter each ROW one time
 - Addresses issues associated with load from OPGW installation
- Replacement of existing 336 ACSR conductor with 1272 ACSS conductor
- Replacement of existing shield wire with OPGW
- Installation of lightning arrestors, and counterpoise/grounding at the base of the structures will improve lightning performance on all three lines

High Priority Replacements

- Replace only overloaded and deteriorated structures
 - Approximately 84% of existing structures would be replaced
 - Majority of remaining wooden structures would be 67 years old and likely to need replacement under future projects
 - Would require Eversource to continuously re-enter ROWs
- Retain existing conductor and shield wire
 - No improvements to lightning performance or telecommunications

Conclusion

- More efficient and cost effective to rebuild entire lines now rather than leaving some 67-year-old structures to be replaced in future projects
- Full rebuild allows replacement of aging conductor and shield wire

Project Scope: Preferred Solution

Structure Replacement Scope:

- **A111 Line:** Replace 118 existing Single-Circuit wooden H-Frame structures with 115 Single-Circuit Steel H-Frames and one (1) steel monopole foundation structure
- **E115 Line:** Replace 179 existing Single-Circuit wooden H-Frame structures with 179 Single-Circuit Steel H-Frames
 - E115 Tap (Ashland Tap to Ashland Substation) is non-PTF and is included in Eversource's Local System Plan – Structure count *does not* reflect this work
- **Z180 Line:** Replace 29 existing Single-Circuit wooden H-Frame structures with 29 Single-Circuit Steel H-Frames
- Installation of lightning arrestors and counterpoise on all three lines

OPGW Scope:

- Replacement of 2 existing Shield Wires with OPGW on all three circuits

Reconductor Scope:

- All three 115-kV lines will be reconducted with 1272 ACSS 54/19
 - A111 Line: Reconductor approximately 10.6 miles
 - E115 Line: Reconductor approximately 14.9 miles
 - Z180 Line: Reconductor approximately 3.4 miles

Estimated Cost = \$100.724 Million (-25% / +50%)

- A111 Line: \$35.940 Million (-25% / + 50%)
- E115 Line: \$55.116 Million (-25% / + 50%)
- Z180 Line: \$9.669 Million (-25% / + 50%)

Projected in-service date: Q4 2022

Questions

