DOCKET NO. 508 – The United Illuminating Company (UI) application for a Certificate of Environmental Compatibility and Public Need for the Milvon to West River Railroad Transmission Line 115-kV Rebuild Project that consists of the relocation and rebuild of its existing 115- kilovolt (kV) electric transmission lines from the railroad catenary structures to new steel monopole structures and related modifications to facilitate interconnection of the rebuilt 115-kV electric transmission lines at UI's existing Milvon, Woodmont, Allings Crossing, Elmwest and West River substations along approximately 9.5 miles of the Connecticut Department of Transportation's Metro-North Railroad corridor traversing the municipalities of Milford, Orange, West Haven and New Haven, Connecticut.	}	Connecticut Siting Council August 18, 2022

Opinion

Introduction

On February 28, 2022, The United Illuminating Company (UI) applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need for a 115-kilovolt (kV) electric transmission rebuild project that traverses the municipalities of Milford, Orange, West Haven and New Haven and consists of (a) construction maintenance and operation of a rebuilt 115-kV electric transmission line within approximately 9.5 miles of existing Connecticut Department of Transportation's (DOT) Metro-North Railroad (MNR) corridor by relocating existing electric transmission lines from railroad catenary structures to new steel monopole structures; and (b) related modifications to facilitate the interconnection of the rebuilt 115-kV transmission lines with UI's existing Milvon, Woodmont, Allings Crossing, Elmwest, and West River Substations. Collectively, the proposed project is referred to as the Milvon to West River Railroad Transmission Line 115-kV Rebuild Project (Project).

Public Need

The purpose of the Project is to maintain the reliability of the bulk transmission grid by addressing the age-related physical limitations of two existing UI owned and operated electric transmission lines located on bonnets attached to railroad catenary structures that are owned by the Connecticut Department of Transportation (DOT) and operated by the Metro-North Railroad (MNR), and rebuild the electric transmission lines on monopole structures to be owned and operated by UI within the DOT right-of-way (ROW) to meet current National Electrical Safety Code (NESC) and UI standards.

UI conducted engineering analyses in 2018 that included the 115-kV transmission lines between Milvon and West River Substations. The analyses included field observations of the catenaries and evaluation of the asset condition of the catenaries, given the existing railroad mechanical loading, as well as the age of both the bonnets and the catenaries. The engineering analyses found age-related asset condition issues for the existing bonnet support system for the UI transmission lines including, but not limited to, loss of structural steel thickness, missing structural members, corrosion expansion, and exposed anchor bolts.

Subsequently, UI identified and evaluated alternative solutions for upgrading the lines, and determined that, to maintain the reliability of the bulk power grid, the 115-kV lines must be relocated off of the bonnets attached to the catenaries and rebuilt using new monopoles, conductor, and optical ground wire (OPGW). Furthermore, UI concluded that the 115-kV lines must be rebuilt to meet current NESC and UI standards, which include, but are not limited to, the ability to withstand a Category 3 hurricane wind loading, i.e. a minimum wind speed of 130 miles per hour.

The ISO-New England, Inc. (ISO-NE) Regional System Plan (RSP) Asset Condition List is a summary of pool transmission facilities[1] in the region that must be rebuilt or modified due to their condition, age, or physical deterioration to comply with the updated NESC standards.[2] Accordingly, the Project is identified on the March 2022 ISO-NE RSP Asset Condition List[3] due to the physical deterioration of the catenaries and the bonnets to which the transmission lines are attached.

Connecticut's Comprehensive Energy Strategy (CES) proposes further investments in grid reliability and identifies three important components to grid reliability: resource adequacy, transmission security and distribution resiliency. The Council notes that utilizing separate monopole structures for UI's transmission lines to meet applicable codes and harden against Category 3 hurricane wind loading would improve transmission security.

Additionally, the Project has the potential to support the transmission of energy from offshore wind projects, by supporting power flows and service to Connecticut customers on the proposed UI replacement transmission lines.

Project Alternatives

A "no-action" alternative would not resolve the known asset condition issues associated with the existing 115-kV lines on top of the catenaries. It would not comply with industry codes and UI standards, and the existing 115-kV lines would continue to be at risk for structural failures associated with mechanical loadings or stress associated with major weather events. This could lead to extended duration outages that would adversely affect electrical customers and the bulk power system.

UI evaluated four overhead transmission alternatives:

a) Install new double-circuit monopoles to the north of the railroad tracks to support the 115-kV lines, which is the proposed Project (Alternative 1);
b) Install one circuit north of the railroad tracks and the other circuit south of the railroad tracks on all single-circuit monopoles (Alternative 2);
c) Rebuild one 115-kV circuit on new single-circuit monopoles and perform structural modifications to the catenaries/bonnets to allow continued support of the other circuit (Alternative 3); and
d) Rebuild the existing catenaries/bonnets to completely correct all structural deficiencies to continue to support both 115-kV lines (Alternative 4).

Alternatives 2 and 3 were rejected because the acquisition of additional permanent easement acreage would be required to rebuild the line on single circuit monopoles on either side of the railroad tracks. Alternative 4 was rejected because extensive structural modifications would be necessary to rebuild any portion of the lines on the existing catenary structures and would cost on the order of 200 percent greater than the proposed Project.

UI also evaluated an all underground alternative between Milvon Substation and West River Substation either within the north side (Option E) or south side (Option F) of the DOT ROW, or within public roads

[1] ISO-NE defines "pool transmission facilities" as facilities rated 69-kV or above owned and maintained by a utility under a Transmission Operating Agreement with ISO-NE.
[2] See Council Petition No. 1293, *available at* https://portal.ct.gov/CSC/3_Petitions/Petition-Nos-1291-1300/Petition-No-1293Eversource
[3] The Project remains identified on the June 2022 ISO-NE RSP Asset Condition List.

(Option G). These underground alternatives were rejected due to significantly greater costs than the proposed Project and DOT's prohibition on longitudinal underground utility occupations within the railroad ROW.

During the proceeding, the following additional alternatives suggested by the Council and the City of Milford were explored:

a) Overhead Transmission Line along the south side of the railroad ROW (Option B);
b) Overhead Transmission Line with reductions in structure heights from 905N to 914N (Milford Overhead Alternative 1/Option C);
c) Overhead Transmission Line shifted to the south side of the railroad ROW from Structures 905N to 914N (Option D);
d) Underground Transmission Line from Structures 905N to 914N within the railroad ROW (Milford Underground Alternative/Option H);
e) Underground Transmission Line from Structures 900N to 914N (Morissette Alternative/Option I);
f) Overhead Transmission Line with reductions in structure heights from Structures 904N to 916N (Milford Overhead Alternative 2/Option J);
g) Overhead Transmission Line on north side of railroad (ROW) shifted to rebuilt catenary structures from Structures 904N to 914N; and
h) Overhead Transmission Line with fewer structures of taller heights. (SHPO Alternative).

All of these suggested additional alternatives have higher costs than the proposed Project, except for the SHPO Alternative, which is equal in cost to the proposed Project. [4]

Project Cost

The estimated cost of the proposed Project (Alternative 1/Option A) is $295,000,000.

A cost breakdown is as follows:

Transmission line costs	$222,550,000
Distribution costs	$ 1,250,000
Substation costs	$ 3,850,000
Miscellaneous costs*	$ 67,350,000
Total	**$295,000,000**

* Including, but not limited to, bonnet decommissioning.

Neither the Project, nor any portion thereof, is proposed to be undertaken by state departments, institutions or agencies, or to be funded in whole or in part by the state through any grant or contract. The entire cost of the Project (except for distribution costs) is anticipated to be regionalized with Connecticut ratepayers paying approximately 25 percent of the Project cost.[5] Any incremental costs (cost delta) beyond the least cost alternative as identified by ISO-NE (i.e. the proposed Project) would be expected to be paid by Connecticut ratepayers.

An all-underground configuration would cost approximately $364M if located within streets; $1.4B if located along the southern side of the ROW; or nearly $1.6B if located along the northern side of the ROW.

[4] Refer to Figure 15 – Cost Table of the Council's Docket No. 508 Findings of Fact for alternative options detail.
[5] Connecticut ratepayers are comprised of UI, Eversource and municipal electric energy cooperative customers.

The City of Milford prefers an underground configuration through Downtown Milford, or, alternatively, for an overhead configuration, transmission structure heights should be minimized; and Option J would minimize structure heights.

Option J has a cost delta of $350,000, or a total cost of approximately $295,350,000.

Project Description

The proposed Project entails the installation of rebuilt 115-kV electric transmission lines and related improvements as listed below:

a) Rebuild the existing 115-kV lines between Milvon Substation and West River Substation in a double-circuit configuration, supported on galvanized steel monopole structures;
b) Interconnect the rebuilt 115-kV lines to UI's existing Milvon, Woodmont, Allings Crossing, Elmwest, and West River Substations, perform minor associated modifications within the substation boundaries and install single-circuit and double-circuit monopoles as necessary to maintain the existing 115-kV connections to the substations and/or support OPGW;
c) Remove, partially remove, or modify certain existing steel monopoles that were installed within the Milvon to West River Substation railroad corridor as part of previous UI transmission upgrade projects; and
d) Decommission and remove the existing 115-kV facilities on the catenaries.

Substations

UI would modify the existing Milvon, Woodmont, Allings Crossing, Elmwest and West River substations by performing hardware modifications on the existing structures within and just outside each substation to accommodate the proposed 1590 kcmil conductor size as well as the new OPGW and associated OPGW splice boxes. The hardware modifications would not result in increased structure heights.

At all of the five substations, new underground fiber optic cable would be installed to connect the fiber at the OPGW splice box (either located within the substation or at a steel monopole outside the substation) to the control enclosures within the substations.

In order to maintain existing 115-kV line substation connections, 16 monopoles would be installed directly outside each substation to correctly align the phases of different circuits to the existing line terminal switches in each substation yard and/or support OPGW.

Transmission Line

The two existing 115-kV lines located on the UI-owned bonnets on top of the DOT-owned catenaries reach a typical height of approximately 60 feet above ground level (agl). UI would remove the two 115-kV lines from the bonnets and install double-circuit galvanized steel monopoles on the north side of the railroad ROW to accommodate the circuits. Specifically, the double-circuit monopoles would support two sets of three 1,590-kcmil Lapwing phase conductors plus OPGW and shield wires for a distance of approximately 9.5 miles between Milvon Substation in Milford and West River Substation in New Haven. Construction would occur in phases, i.e. one segment at a time between adjacent substations. Continuity of service of the substations would be maintained. UI's existing bonnets on top of the DOT's catenaries would be decommissioned.

Environmental

The Project is located within the MNR rail corridor. The edges of the railroad corridor are interspersed with mature mixed deciduous hardwood trees among narrow strips of primarily non-native, shrub/scrub invasive vegetation, escaped ornamentals associated with residential landscaping, and species common to freshwater and tidal wetlands. Elevations along the railroad corridor range from 5 feet above mean sea level (amsl) to 100 feet amsl, with the highest and lowest points located in West Haven.

Work at the substations would include, but not be limited to, performing hardware modifications on the existing structures within and just outside each substation that would not result in increased structure heights.

Vegetation

UI would manage vegetation in compliance with NERC Transmission and Vegetation Management Operating Procedures to prevent vegetation-related outages under various weather and operating conditions. For the DOT ROW, a minimum of 25-foot clearance from conductors at rest is required.

Total tree clearing for temporary construction activities would be approximately 6.12 acres. After completion of construction, these areas would be allowed to revegetate naturally, including with trees. The total tree clearing to accommodate the permanent project footprint would be approximately 21.74 acres. This area would be permanently managed in low-growth species consistent with overhead transmission line operation and vegetation maintenance.

To minimize potential impacts on watercourses, existing riparian vegetation within 25 feet of watercourse banks would be maintained or cut selectively to the extent practical. Vegetation clearing would impact 23 of 41 wetlands. UI would develop a final Wetland Invasive Species Control Plan to be included in the Development and Management (D&M) Plan. In accordance with C.G.S. §16-50hh, the Council recommends UI incorporate habitat for the benefit of pollinators such as moths, butterflies and bees in its restoration plan for disturbed areas.

Wetlands and Watercourses

A total of 41 wetland areas were identified within the DOT ROW. Ten new monopoles would be located within wetlands. Additionally, three permanent access roads (for operations and maintenance purposes) would cross wetlands. Total permanent wetland impact area for the Project would be approximately 1.09-acre, and total temporary wetland impact area would be approximately 5.53 acres. Total wetland vegetation clearing area would be approximately 3.61 acres. UI would coordinate with DEEP and/or U.S. Army Corps of Engineers and obtain necessary authorizations for proposed activities within wetlands.

No vernal pool habitat is located in the vicinity of the Project area.

The Project area extends across a total of 36 watercourses: 13 perennial streams and 23 and intermittent streams. The Project would span the Wepawaug River and the Indian River in Milford and the West River on the New Haven/West Haven City Line, and thus no work would be performed in these watercourses. Smaller watercourses, including the narrow streams that parallel the railroad tracks, would be crossed via temporary construction mats or equivalent. Permanent access roads would be installed across three un-named intermittent streams. Total temporary impacts to watercourses would be approximately 0.32-acre, and total permanent impacts to watercourses would be approximately 0.03-acre. UI would obtain the required permits from state and federal agencies for the permanent watercourse crossings.

Eight monopoles would be located within the 100-year flood zone, and five monopoles would be located within the 500-year flood zone. The installation of these structures would have a negligible effect on floodplain storage capacity.

Wildlife

Two federally-listed species may be present within the Project area: northern long-eared bat (NLEB), a federally-listed Threatened Species; and the red knot, a federally-listed Threatened Species. The Project area is not located within 150 feet of a known occupied maternity roost tree or within 0.25-mile of a known NLEB hibernaculum. The nearest NLEB habitat resource to the Project area is located over six miles away. Additionally, the Project area does not provide suitable foraging habitat for the red knot. Thus, the Project is not expected to impact red knot habitat.

Based on review of the Natural Diversity Database (NDDB) for state endangered, threatened or special concern species and ongoing consultations with the Department of Energy and Environmental Protection (DEEP), seven state-listed species were identified as potentially occurring within or proximate to the Project area. The seven state-listed species are the Parker's pipework, a state-listed Endangered Species; salt marsh bulrush, a state-listed Species of Special Concern; seaside sparrow, a state-listed Threatened Species; saltmarsh sharp-tailed sparrow, a state-listed Species of Special Concern; northern leopard frog, a state-listed Species of Special Concern; eastern box turtle, a state-listed Species of Special Concern; and the northern diamondback terrapin, a state-listed Species of Special Concern.

UI conducted a field botanical survey for the two state-listed plant species in September 2020, and these species were not identified during the survey.

UI would comply with DEEP-recommended protective measures for the state-listed bird, amphibian and reptile species. The Council will require plans to comply with DEEP NDDB recommendations in the D&M Plan.

Historic and Cultural Resources

A Phase 1A Cultural Resources Assessment Survey was performed in 2021 and identified five properties/districts listed on the National Register of Historic Places (NHRP). The five properties/districts are as follows:

a) The Academy of Our Lady of Mercy – Lauralton Hall at 200 High Street, Milford;
b) River Park Historic District between Boston Post Road and Milford Harbor, Milford;
c) U.S. Post Office – Milford Main at 6 West River Street, Milford;
d) Saint Peter's Episcopal Church at 61, 71 and 81 River Street, Milford; and
e) Taylor Memorial Library at 5 Broad Street, Milford.

The Phase IA Report noted that a previously identified archaeological site (Site 107-15) had potential to be impacted by a Project access road. A Phase 1B Survey was performed, and a report was submitted to SHPO. The Phase IB Report indicated that Site 107-15 does not extend into the proposed access road location and would not be impacted by the Project. SHPO concurred and noted that additional archaeological investigations are not warranted.

By letter dated December 22, 2021, SHPO indicated that all five NRHP resources would be impacted by the Project. UI met with SHPO to discuss mitigation measures. SHPO suggested the production of a pedestrian survey, mapping, and historic research of Charles Island to be codified and submitted in a report

to SHPO, as well as the production and installation of interpretive signage based on such report. SHPO requested the Charles Island mitigation measures be included as a requirement for project approval and solidified in an agreement once permitting is secured.

Rather than install interpretive signage at Charles Island, which is located over a mile away and bears no relationship to the historic resources in the Project area, the City of Milford recommends mitigation measures that are more closely aligned with the Project, such as building conditions assessments or preservation plans for the Taylor Memorial Library or the Milford Railroad Station, updating the River Park Historic District NRHP nomination or installing historic interpretive signage on the Milford Green. Thus, the Council recommends that UI consult with the City of Milford regarding possible mitigation measures for historic resources that are closely aligned with the project.

Option J includes reduced structure heights from P904N to P916N. This particular section spans the historic areas of Downtown Milford (in the vicinity of the five resources listed on the NRHP) and is located between roughly west of Beardsley Avenue to east of Prospect Street. Option J would reduce visual impacts to this historic area with the smallest cost delta of all of the alternatives. With a cost delta of $350,000 beyond the originally proposed $295M Project, these reduced visual impacts to historic areas can be achieved with a very modest cost increase of 0.12 percent.

Visibility

The existing catenaries are visible year-round from approximately 1,673 acres (or 12% of the one-mile Study Area) and seasonally visible from about 477 acres (or 3.4% of the Study Area). Based on the final viewshed analysis, the originally proposed Project would be visible year-round from approximately 1,673 acres (or 12% of the Study Area) and seasonally visible from about 477 acres (or 3.4% of the Study Area). The areas of visibility generally extend to distances of 0.5-mile from the Project route. In some undeveloped areas, open water and marsh, it would extend to at least 0.75 mile.

The tops of the new transmission line structures would not be prominent features, particularly with the amount of intervening existing infrastructure common within the Project area.

While some locations would experience changes in visibility from existing conditions due to the relocation and modified heights of new structures, such areas would also have the removal of bonnets and other supporting infrastructure, particularly along the southern side of the railroad corridor.

The most substantial change in visibility would occur at the West River crossing where four 120-foot monopoles would replace the 89-foot tall catenary bonnets (to be removed). This area contains extensive open marshland on either side of West River; developed portions of this area contain commercial and industrial land uses.

There are no state or locally-designated scenic roads located within the one-mile Study Area.

There are no “blue-blazed” hiking trails maintained by the Connecticut Forest and Park Association within one-mile of the Project route. The Project is not located proximate to any National Heritage Corridors or any state designated heritage areas. The Project is also not located proximate to any DOT designated Scenic Land Strips or locally-designated scenic roads.

The Project is consistent with the FERC Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities as it utilizes existing rights-of way within a railroad corridor.

Option J, with reduced structure heights from P904N to P916N, would have height reductions ranging from 5 to 20 feet and a net increase of one structure for this section in Downtown Milford. Accordingly, the Council will require that UI utilize the Option J configuration because it would minimize structure heights in Downtown Milford at the smallest cost delta of the alternatives.

The visual impacts associated with the substation modifications are not expected to be significant because equipment heights within the substations are not expected to increase.

DOT/MNR Considerations

According to SHPO, the MNR railroad corridor, formerly the New York, New Haven & Hartford Railroad, is eligible for listing on the Natural Register, under Criteria A, in the area of transportation, as well as in the development of the Connecticut shoreline.

UI has a lease agreement with DOT for collocation of electric transmission facilities within the railroad ROW and a maintenance agreement with MNR for the bonnets on the catenary structures. UI's removal of its 115-kV lines from catenary structures along six miles of the MNR corridor between the Cities of Bridgeport and Milford was approved by the Council in Petition Nos. 1110, 1138, 1176, and 1304.

The New Haven Line corridor is one of the busiest railroads in the nation. DOT prefers that UI's transmission lines are removed from the existing catenaries because it would facilitate DOT's maintenance of its equipment by not having to request UI transmission line outages.

Normal work hours for the proposed Project would be 7 AM to 7 PM Monday through Saturday. Construction may occur on nights and Sundays as necessary to perform work during non-peak railroad use periods in order to minimize impacts to the rail system. For the installation of new foundations within the DOT corridor, UI would coordinate with DOT/MNR to determine appropriate drilling methods to avoid any potential for impacts to the rail bed. If blasting is required, UI would consult with DOT and MNR prior to securing approvals for its Blasting Plans.

Electric and Magnetic Fields

Included in the review of the Project's environmental impact was a review of electric and magnetic fields (EMF). In accordance with the Council's *Electric and Magnetic Fields Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*, UI reviewed current literature to determine if there were new developments or guidelines related to EMF exposure. No changes were identified. Additionally, UI developed a Field Management Design Plan (FMDP) to investigate cost effective ways to minimize MF levels resulting from the rebuilt transmission lines. As part of the FMDP, UI would utilize distance via the rebuilt lines located farther from the southern DOT boundary and the use the permanent easements (where necessary) north of the DOT boundary; and double-circuit vertical structures while arranging the conductor phases to achieve substantial MF cancellation. This "no cost/low cost" design was used to develop the pre and post project MF calculations. Upon review of the MF data provided in the Application, the Council finds the MF levels associated with the project to be well below recommended MF exposure standards from research groups.

Conclusion

The Council finds that there is a public need for the proposed Project as it is necessary for the reliability of the electric power supply of the state, serves the interests of electric system economy and reliability, and

conforms to a long-range plan for resiliency of the electric systems serving the state and interconnected utility systems.

The Council has examined the Project in accordance with the policies of the state concerning the natural environment, ecological balance, public health and safety, scenic, historic and recreational values, agriculture, forests and parks, air and water purity, and fish, aquaculture and wildlife, together with all other environmental concerns, including EMF, and balanced the interests in accordance with Conn. Gen. Stat. § 16-50p(a)(3)(B) and Conn. Gen. Stat. § 16-50p(a)(3)(C). The environmental effects that are the subject of Conn. Gen. Stat. § 16-50p (a)(3)(B) can be sufficiently mitigated and do not overcome the public need for the facility. Furthermore, the Council finds that the location of the rebuilt transmission line will not pose an undue hazard to persons or property along the area traversed by the transmission line pursuant to Conn. Gen. Stat. § 16-50p (a)(3)(E).

The Council will require UI to submit a D&M Plan for the Project in accordance with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies (RCSA) to include, but not be limited to: detailed site plans identifying structure and equipment locations as well as access roads; bonnet decommissioning plan; wetland invasive species control plan; plans to comply with DEEP NDDB recommendations to reduce impacts to state-listed endangered, threatened and special concern species; an erosion and sediment control plan consistent with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*; a spill prevention control and countermeasures plan; provisions for on-site environmental inspection and monitoring of the ROW and substations during construction; and pre-construction and post-construction measurements of EMF. Pursuant to RCSA Sections 16-50j-60 through 16-50j-62, the Council will require UI to submit quarterly construction progress reports.

With the conditions listed above, the Council will issue a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of rebuilt 115-kV transmission facilities between Milvon Substation in Milford and West River Substation in New Haven and related substation and line improvements utilizing the Option J Configuration.