DOCKET NO. 3B – The United Illuminating Company Amended Certificate of Environmental Compatibility and Public Need for replacement of a portion of the existing Derby – Shelton 115-kV electric transmission line facility. **Reopening of this Certificate based on changed conditions pursuant to Connecticut General Statutes §4-181a(b).**	}	Connecticut Siting Council

October 21, 2022

DRAFT Opinion

Introduction

On January 16, 1974, the Connecticut Siting Council (Council) granted The United Illuminating Company (UI) a Certificate of Environmental Compatibility and Public Need (Certificate) for replacement of a portion of an existing 115-kilovolt (kV) electric transmission line facility that traverses the municipalities of Ansonia, Derby and Shelton (Original Project). On December 2, 1976, the Council approved an amendment to the Certificate for the Original Project.

The parties to the original Docket Nos. 3 and 3A proceedings were UI: the City of Derby; the City of Shelton; the Attorney General; State Representative - 104th District; State Representative - 113th District; State Senator - 17th District; State Senator - 32nd District; and Tanya Malse.

The existing 115-kV electric transmission line facility serves customers in Ansonia, Derby and Shelton. The infrastructure supporting the facility is almost 100 years old. As a result of identified asset condition issues associated with the existing facility, and to meet current National Electrical Safety Code (NESC) standards, UI evaluated alternatives and designed the Derby Junction to Ansonia 115-kV Transmission Line Rebuild Project (Project).

Changed Conditions

On May 13, 2022, UI submitted a Motion to Reopen and Modify (Motion to Reopen) the Council's January 16, 1974 final decision to issue a Certificate and the Council's December 2, 1976 final decision to modify the Certificate for the Original Project based on changed conditions pursuant to Connecticut General Statutes (CGS) §4-181a(b).

In its Motion to Reopen, UI identified changed conditions related to existing transmission line asset condition issues including, but not limited to:

a) In 2012, UI commenced engineering studies that determined that the 115-kV conductors and insulators needed to be replaced; and
b) Upgrades to the 115-kV transmission structures would be necessary to support the new conductors, insulators, and associated overhead shield wires (OHSW) and optical ground wires (OPGW) to meet current electrical industry standards, conductor clearance requirements, and improve reliability and resiliency.

On May 16, 2022, the Council issued a memorandum to the service list for the original Docket Nos. 3 and 3A proceedings requesting comments or statements of position in writing with respect to whether the Motion to Reopen should be granted or denied by June 2, 2022. At a public meeting held on June 9, 2022, the Council voted to grant UI's Motion to Reopen and to schedule a public hearing on the Project.

Pursuant to CGS § 16-50m, the Council, after giving due notice thereof, held a remote public hearing on July 28, 2022, beginning with the evidentiary session at 2:00 p.m. and continuing with the public comment session at 6:30 p.m. via Zoom conferencing.

Public Need

The purpose of the Project is to improve the reliability of the transmission grid by addressing the asset condition issues associated with two existing 115-kV UI owned and operated electric transmission lines located within an existing 4.1-mile long UI right-of-way (ROW) between Derby Junction and Ansonia Substation, and rebuild the electric transmission lines on monopole structures to be owned and operated by UI within the ROW to meet current NESC and UI standards.

UI conducted engineering studies in 2020 and 2021 that included the 115-kV transmission lines between Derby Junction and Ansonia Substation. These studies included evaluations of conductor tensile strength; thermal-mechanical cycling and combined mechanical-electrical testing of insulators; climbing and visual inspections; and mechanical loading and conductor sway simulations of the existing structures. Such studies found that the existing copper conductors were nearing the end of their useful life and had reductions in tensile strength. Furthermore, the insulators demonstrated electrical failures. Thus, UI determined the two 115-kV lines would require new conductors, insulators and shield wires.

The engineering studies also found that 80 percent of the existing structures supporting the two 115-kV lines had asset condition issues associated with the structures and their foundations. Additionally, a majority of the existing structures would not structurally support the additional loading associated with reconductoring, and the NESC conductor clearance requirements could not be met.

Subsequently, UI identified and evaluated alternative solutions for upgrading the lines, and determined that, to maintain the reliability of the power grid, the 115-kV lines must be rebuilt using new monopoles, conductor, OPGW and OHSW. 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 condition, age, or physical deterioration to comply with the updated NESC standards.[2] Accordingly, the Project is identified on the June 2022 ISO-NE RSP Asset Condition List as a "Proposed" project. This means that UI, the asset owner, has determined that the solution is appropriate to address the asset condition issue, and such solution has been presented to the ISO-NE Planning Advisory Committee.

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 the proposed replacement structures for UI's transmission lines to meet applicable codes and harden against Category 3 hurricane wind loading would improve transmission security.

[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

Project Alternatives

A "no action" alternative would not resolve the known asset condition issues associated with existing lattice tower structural deficiencies, deteriorated conductors and aging associated hardware. Transmission reliability would remain at risk due to the conductor and hardware conditions and the risk of structural failures of the existing lattice structures that would result in extended power outages. Such outages would adversely affect service to UI's electrical customers and the integrity of the regional electrical transmission system.

UI evaluated four overhead alternatives:

a) Install a combination of double-circuit and single-circuit monopole replacement structures to perform a complete line rebuild, which is the proposed Project (Alternative 1);
b) Partially upgrade the existing structures (Alternative 2);
c) Partially upgrade the existing structures and add 8 additional monopoles (Alternative 3); and
d) Install only single-circuit monopole replacement structures to perform a complete line rebuild (Alternative 4).

Alternatives 2 and 3 were rejected because, as partial rebuilds, they would require complex engineering/design and construction sequencing, and they would pose a higher reliability risk because some existing lattice structures (with asset condition issues) would remain in service. Alternative 4 was rejected because it is more costly than Alternative 1 due to the use of all single-circuit structures.

UI evaluated an all underground configuration alternative consisting of a double-circuit 115-kV cross-linked polyethylene (XLPE) cable configuration from Derby Junction to Ansonia Substation. This all-underground alternative was rejected because of the significantly higher costs of underground transmission line construction and operation; and significantly greater environmental impacts such as the horizontal directional drilling or jack and bore under the Housatonic River, ledge rock removal, and wetland impacts.

Existing lattice Structure Nos. 10 through 12 are located in the ROW in Osbornedale State Park (OSP). With Alternative 1, UI would remove Structure Nos. 10 and 12 from within OSP and install replacement Structure Nos. 10 and 12 outside of OSP. UI would replace Structure No. 11 with a double-circuit monopole within OSP. UI would also acquire approximately 1.82 acres of additional permanent easement (or roughly 60 feet of additional width west of the existing easement) within OSP to comply with NESC and UI clearance requirements.

If the proposed 60-foot wide permanent easement from the Department of Energy and Environmental Protection (DEEP) cannot be secured over OSP, UI has evaluated nine alternatives for aligning the rebuilt 115-kV lines across OSP including configurations using or expanding the existing ROW, using the State Route 8 corridor and using local road ROWs.

The options related to OSP are listed below. Option 1 is the proposed Project (Alternative 1).

a) **Option 1A – Underground 115-kV along existing ROW.** UI would underground double-circuit XLPE cable between Structure Nos. 10 and 12, and it would have a cost delta of approximately $31.4M relative to the proposed portion of the route;

b) **Option 1B – No ROW Expansion.** UI would utilize an overhead alternative that would avoid the need for any additional permanent easement, and it would have a cost delta of approximately $1M relative to the proposed portion of the route;

c) **Option 1C – Reduced ROW Expansion.** This would be similar to the proposed project, except for a taller, rebuilt Structure No. 11 and a smaller additional easement. It would have a cost delta of approximately $2.8M;

d) **Option 1D – ROW Expansion to the East.** This would require expanding the ROW approximately 30 feet to the east between Structure Nos. 10 through 12. This option was rejected due to impacts to seven residential properties;

e) Option 2A – Overhead Aligned with Route 8 Corridor. This would require an overhead segment from Structure 10 to Structure 14. This option was rejected because DOT opposes co-location of electric transmission lines in state road ROW, particularly if other route alternatives exist; and additional easements would be required from private landowners;

f) **Option 2B – Underground Aligned with Route 8 Corridor.** This would be similar to Option 2A except it would be underground. This option was rejected because DOT opposes co-location of electrical transmission in state road ROW, particularly if other route alternatives exist; and additional easements would be required from private landowners;

g) **Option 3 – Underground Structure No. 10 to Structure No. 16.** This would be an underground route from Silver Hill Road to Hull Street. This option was rejected due to substantial environmental and land use impacts and significantly greater cost than overhead options;

h) **Option 4 – Underground Structure No. 10 to Ansonia Substation – Northern Route.** This would be a northern underground route from Structure No. 10 to Ansonia Substation, and it would have a cost delta of approximately $148M relative to the proposed portion of the route; and

i) **Option 5 – Underground Structure No. 10 to Ansonia Substation – Southern Route.** This would be a southern underground route from Structure No. 10 to Ansonia Substation, and it would have a cost delta of approximately $185M relative to the proposed portion of the route.

Based on the record in this proceeding, the Council finds that among the alternatives evaluated, Alternative 1 is the most economical and offers the desired reliability benefits, including transmission security. For the OSP ROW segment, as a contingency plan to Option 1, UI is amenable to Options 1A, 1B, 1C, 4, or 5 if the proposed 60-foot wide permanent easement from DEEP cannot be secured over OSP. Accordingly, the Council shall order UI to submit to the Council any alternative configurations to OSP Option 1 that may result from consultation between UI and DEEP for review and approval prior to commencement of construction at the OSP ROW segment.

Project Cost

The estimated cost of the proposed Project (Alternative 1) is $57.2M. If necessary, any cost delta associated with OSP Options 1A, 1B, 1C, 4, or 5, would be additional.

The estimated cost of Alternative 1 is listed below:

Transmission Line Costs	$36,357,330
Distribution-related Costs	$1,000,000
Substation Costs	$139,052
Misc. Costs (e.g. removals, sales tax, escalation, and contingencies)	$19,703,112
Total Estimated Costs	**~$ 57.2M**[3]

The cost of the proposed Project is anticipated to be regionalized with Connecticut ratepayers paying approximately 25 percent of the Project cost.[4]

Project Description

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

a) Rebuild the 115-kV lines on 41 new self-supporting steel structures (consisting of 25 double-circuit monopoles, 15 single-circuit monopoles and one single-circuit H-frame structure).

b) Replace the existing 4/0 copper conductors and shield wire with 795 kcmil aluminum conductor steel reinforced (ACSR) conductor;

c) Upgrade overhead shield wire (OHSW) and install optical ground wire (OPGW) between Derby Junction and Indian Well Substation;

d) Install OPGW between Indian Well Substation and Ansonia Substation;

e) Install OHSW along the Housatonic River crossing;

f) Interconnect the rebuilt circuits at Derby Junction, Indian Well Substation and Ansonia Substation; and

g) Remove and recycle or properly dispose of the existing 115-kV structures, conductors, insulators and associated hardware, and remove the existing structure foundations.

During the proceeding, UI determined it was feasible to install a double-circuit monopole (in lieu of two single-circuit monopoles) at Structure No. 4, thereby reducing the total monopole quantity by one.

Substations

UI would modify the existing Ansonia and Indian Well Substations by performing hardware modifications on the line termination sides of existing A-frame structures and H-frame structures, respectively. New fiber splice boxes would also be installed to terminate the OPGW fibers. The hardware modifications would not result in increased structure heights.

[3] The modifications to the Structure No. 4 configuration (with a cost delta of approximately $350k) were not contemplated in the original OSPRM project cost of approximately $57.2M.
[4] Connecticut ratepayers are comprised of UI, Eversource and municipal electric energy cooperative customers.

UI does not propose any modifications at Derby Junction, other than to connect the rebuilt #1560-3 and #1808-2 Lines to the Eversource transmission system and to remove the existing 115-kV line connections. At Derby Junction, Eversource plans to replace Structure No. 1364, a double circuit lattice structure with a two-pole structure. New Eversource Structure 19624 will support the 1560 Line and new Eversource Structure 19624A will support the 1808 Line.

Construction will be sequenced such that one of the 115-kV circuits between Derby Junction and Ansonia Substation will be energized at all times to maintain electric service to customers.

Transmission Line

The two existing 115-kV lines located on 40 UI-owned structures, consisting of 29 lattice structures and 11 other structures. UI would remove the two 115-kV lines from the lattice structures and install primarily double-circuit galvanized steel monopoles to accommodate the circuits. Specifically, the double-circuit monopoles would support two sets of three 790-kcmil Drake phase conductors plus new OPGW and upgraded OHSW for a distance of approximately 4.1 miles between Ansonia Substation in Ansonia and Indian Well Substation in Derby. Continuity of service of the substations would be maintained. UI's existing lattice structures would be decommissioned.

Environmental

The Project area and along the ROW consists of a mix of vegetative cover types, ranging from open fields and forests to urban commercial/industrial development with minimal vegetation and suburban lawns with ornamental trees and landscaping. Riparian and wetland habitats are present along the Housatonic River and various streams and wetlands in the Project area. Elevations within the Project area range from 0 feet above mean sea level (amsl) to 600 feet amsl, with the highest point located in Shelton and lowest points located in Ansonia, Derby and Shelton.

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.

Total tree clearing for the Project would be approximately 6 acres. Of the 6 acres, approximately 5.6 acres would remain in shrub-scrub vegetation within the ROW, and 0.4 acre would be allowed to fully revegetate after completion of the Project construction.

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 2 of 10 wetlands. UI would develop a final Wetland Invasive Species Control Plan for restoration of disturbed areas 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 10 wetland areas (9 tidal and 1 non-tidal) were delineated within the existing Project ROW. No rebuilt structures would be located within wetlands. Total permanent wetland impact area for the Project (i.e. wetland fill) would be approximately 2,500 square feet, and total temporary wetland impact area would

be approximately 5,300 square feet. Total wetland vegetation clearing area would be approximately 350 square feet, but such clearing would be a conversion from forested to shrub-scrub with no net reduction in wetland function. 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 10 watercourses. UI would install a permanent access road from Structures Nos. 355, 356 and 357, which would require two permanent culverts to cross intermittent stream WC2. UI would utilize protective measures to minimize impacts to water resources and would obtain the required permits from state and federal agencies for the permanent watercourse crossings.

Three monopoles would be located within the 100-year flood zone, and four monopoles would be located within the 500-year flood zone. The Project is not expected to have any adverse effects on flood dynamics, and it would not alter the floodplains or risk of flooding.

Wildlife

One federally-listed species may be present within the Project area: northern long-eared bat (NLEB), 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 18 miles away. Notwithstanding, UI would avoid tree clearing during the months of June, July and August on the western side of the ROW at OSP to be protective of tree roosting bat species.

Based on review of the Natural Diversity Database (NDDB) for state endangered, threatened or special concern species and ongoing consultations with DEEP, two state-listed species were identified as potentially occurring within or proximate to the Project area. The two state-listed species are the sedge wren, a state-listed Endangered Species; and the bald eagle, a state-listed Threatened Species.

UI would comply with DEEP-recommended mitigation measures for the state-listed bird species. UI would continue to consult with DEEP regarding species-appropriate mitigation strategies, and such final mitigation plans would be incorporated in the D&M Plan. The Council will require the final plans to comply with DEEP NDDB recommendations in the D&M Plan including, but not limited to, plans to avoid tree cutting during the months of June, July and August on the western side of the ROW at OSP to protect tree roosting bat species.

Historic and Cultural Resources

A Phase 1A Cultural Resources Assessment Survey (Phase 1A Survey) was performed in 2021 and indicated that no properties/districts listed on the National Register of Historic Places (NRHP) or identified archaeological sites are located proximate to the Project ROW. Notwithstanding, the Phase 1A Survey indicated that the western portion of the ROW between Structure Nos. 350 and 356 had a moderate to high potential to yield intact cultural deposits. Thus, a Phase IB Cultural Reconnaissance Survey (Phase IB Survey) was recommended.

A Phase 1B Survey was performed and a report dated March 2022 (Phase IB Report) was submitted to the State Historic Preservation Office (SHPO). By letter dated July 16, 2022, SHPO concurs with the Phase IB report that no additional archaeological investigations are warranted, and the Project would not have an adverse effect on historic resources.

Visibility

The existing lattice structures are visible year-round from approximately 352 acres (or 5% of the one-mile Study Area) and seasonally visible from about 681 acres (or 10% of the Study Area). Based on the final viewshed analysis, the Project would be visible year-round from approximately 405 acres (or 6% of the Study Area) and seasonally visible from about 732 acres (or 11% of the Study Area).

Views of the ROW would continue to generally extend over distances of up to 0.25-mile in most areas due to a combination of topography and mature vegetation. In non-residentially developed areas and over open water, areas of visibility would extend to 0.5 to 0.75-mile due to the sparse vegetation and relatively unobstructed sight lines.

Views of the existing ROW would continue from portions of the Paugussett Trail for approximately 0.5 mile east of Derby Junction where it veers to the north. Some portions of the trail system within OSP would also have views of the monopoles within the ROW. 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 when modifying transmission facilities.

The Council concurs with UI's proposed change from two single-circuit monopoles to one double-circuit monopole for Structure No. 4 because it would reduce the number of structures in proximity to residential areas along Hawthorne Avenue in Derby from two to one. This could be accomplished with a modest cost delta of approximately $350k, relative to the proposed project cost. Similarly, Council will require review and consideration of double-circuit monopole configurations for Structure Nos. 17 and 18 (located in Ansonia) in the D&M Plan due to their proximity to residential areas along Scotland Street.

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: taller structures to raise the heights of the conductors; and the use of mostly double-circuit vertical structures[5] while arranging the conductor phases to achieve mutual 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.

[5] The optimum phase arrangement would be utilized for areas where separate single-circuit monopoles would be installed, and the horizontal conductor spacings would be comparable to those of the double-circuit structure configurations.

Public Safety

The proposed Project would be constructed in full compliance with the NESC, standards of the Institute of Electrical and Electronic Engineers, the American National Standards Institute, good utility practice, and UI's technical specifications. UI would utilize existing protective relaying equipment to automatically detect abnormal system conditions and isolate the faulted section of the transmission system. The relay and control enclosures at each of the two substations are equipped with portable fire extinguishers that comply with National Fire Protection Association standards. For any fire extinguishing equipment associated with the Project, the Council will order UI to comply with the state ban on the use of Class B firefighting foam containing perfluoroalkyl or polyfluroralkyl substances (PFAS) under Public Act 21-191

Although no Federal Aviation Administration marking or lighting is not required for any of the proposed structures, UI would voluntarily install unlighted marker balls of alternating orange, white and yellow colors on the topmost overhead shield wires along the Housatonic River crossing (i.e. between Structure Nos. 359 and 360). The Council notes that helicopters may be employed during construction of the Project and will require UI to submit a plan to notify the public when helicopters would be used for Project construction as part of the D&M Plan.

UI expects only short-term construction-related noise effects from the Project and once completed, Project operation will comply with DEEP Noise Control Regulations. Normal work hours for the proposed Project would be 7 AM to 7 PM Monday through Saturday. Certain construction tasks would need to be performed on Sundays or at nighttime. Blasting is not expected to be necessary for the Project.

Conclusion

Based on the record of this proceeding, the Council finds that changed conditions associated with the existing electric transmission line and substation facilities warrant modification of the Certificate and 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 CGS § 16-50p(a)(3)(B) and CGS § 16-50p(a)(3)(C). The environmental effects that are the subject of CGS § 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 facility will not pose an undue hazard to persons or property along the area traversed by the transmission line pursuant to CGS § 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) and to submit quarterly construction progress reports.

The Council will also require UI to comply with the state ban on the use of Class B firefighting foam containing perfluoroalkyl or polyfluroralkyl substances (PFAS) under Public Act 21-191 and submit to the Council for review and approval any alternative configurations to OSP Option 1 that may result from consultation between the UI and DEEP prior to commencement of construction at the OSP ROW segment.

With the conditions listed above, the Council will issue a Modified Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of rebuilt 115-kV transmission facilities, associated equipment and related improvements to Ansonia Substation in Ansonia, and to Derby Junction and Indian Well Substation in Derby utilizing the Alternative 1 Configuration.