

AN APPLICATION OF THE CONNECTICUT LIGHT AND POWER COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR RECONSTRUCTION OF A 115 kV ELECTRIC TRANSMISSION LINE BETWEEN TRUMBULL JUNCTION IN TRUMBULL AND OLD TOWN SUBSTATION IN BRIDGEPORT. : CONNECTICUT SITING COUNCIL : May 7, 1986

F I N D I N G S O F F A C T

1. The Connecticut Light and Power Company (CL&P), acting by its agent, Northeast Utilities Service Company (NU), in accordance with the provisions of section 16-501 of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) on November 22, 1985, for a certificate of environmental compatibility and public need for the reconstruction of an overhead 115 kV electric transmission line along an existing route from Trumbull Junction in Trumbull and Old Town Substation in Bridgeport. (CGS 16-50g, et seq.) (Record)
2. The fee as prescribed by section 16-50v-1(a) of the Regulations of Connecticut State Agencies (RSA) accompanied the application. (Record)
3. The application was accompanied by proof of service as required by section 16-501(b) of the General Statutes. (Record)
4. Affidavits of newspaper notice as required by statute and section 16-501-1 of the RSA were filed with the application. (Record)
5. Pursuant to section 16-50j of the CGS, the Connecticut Department of Environmental Protection (DEP) filed written comments with the Council. (Record)
6. The Council and its staff made an inspection of the proposed facility on February 25, 1986. (Record)

7. Pursuant to section 16-50m of the CGS, the Council, after giving due notice thereof, held a public hearing at 7:00 P.M., February 25, 1986, in the Meeting Room, Trumbull Public Library, 33 Quality Street, Trumbull, Connecticut. (Record)
8. The parties to the proceeding are the applicant and those persons and organizations whose names are listed in the Decision and Order which accompanies these findings. (Record)
9. The Council took administrative notice of the following document:  
American National Standard Institute: National Electrical Safety Code (NESC), 1984 edition. (Record)
10. Exhibits submitted by the applicant are as follows:  
NUSCO-1. Application, Volume #1, dated November 22, 1985.  
NUSCO-2. Application, Volume #2, dated November 22, 1985.  
NUSCO-3. Responses to Council Interrogatories dated January 31, 1986.  
NUSCO-4. Pre-filed testimony of Dorian E. Hill.  
(Record)
11. The CL&P Trumbull Junction-Old Town line is located within the customer service area of the United Illuminating Company (UI). The line serves the customer load of southwestern Connecticut including customers of both CL&P and UI. The generation and transmission of electricity is supplied to both companies' customers in a joint cooperative manner. (NU 1, p. 1)
12. The existing double circuit 115,000 volt (115 kV) electric transmission line from Trumbull Junction to Old Town Substation would be reconstructed along the center of the existing right-of-way over a distance of 3.1 miles: 2.2 miles are located in Trumbull and 0.9 miles are in Bridgeport. (NU 1, p. ii)

13. The present towers were installed in the 1950's with each circuit (identified as #1710 and #1730) consisting of three conductors and one lightning shield wire. The original cable was 4/0 copper conductors and was replaced in the early 1970's with 556.5 kcmil aluminum conductor steel reinforced (ACSR) conductors, the heaviest cable available at the time that the structures were capable of supporting. (NU 1, p. 1)
14. The Southwest Connecticut area is supplied by four 115 kV transmission circuits:
  1. Devon-Pequonnock-Old Town 1710 circuit;
  2. Devon-Pequonnock-Weston 1730 circuit;
  3. Pequonnock-Ash Creek 91001 circuit; and
  4. Plumtree-Ridgefield-Peaceable 1565 circuit.Additionally, this area is interconnected with the Long Island Lighting Company (LILCO) by one 138 kV circuit under Long Island Sound. (NU 1, p. 5)
15. Local generation feeding into these lines includes Norwalk Harbor Units 1 and 2 and three Cos Cob gas turbines, totaling 376.5 MW. Other generating units affecting transmission flows into the southwest Connecticut area include Bridgeport Harbor, New Haven Harbor, and Devon, totaling 1,340 MW, at summer rating. (NU 1, p. 5)
16. The southerly circuit, known as the 1710 circuit, could overload under certain system conditions by the summer of 1988. The Trumbull Junction-Old Town-Weston segment, known as the 1730 circuit, could reach its capacity by 1990. This could jeopardize the reliability of service to the southwest Connecticut area. Increasing generation at Norwalk Harbor and Cos Cob and increasing power flows on the Long Island Cable would not be economical. (NU 1, p. ii, 4)

17. From 1976 to 1985, there were fourteen occasions when one of the Norwalk Harbor generator units was forced out of service at the same time one of the critical transmission circuits was out on a scheduled basis. Also, during the same time period, there were five occasions when a circuit was forced out of service while a unit was out of service on a scheduled basis. (NU 3, Q. 18)
18. The Southwest Connecticut transmission system has been approaching maximum load capacity. The load growths of the early 1970's indicated a 345 kV loop would be necessary. However, the lower load growth experienced in the late 1970's and early 1980's has postponed the need for a 345 kV line, and no schedule for its implementation has been developed. (NU 1, p. 4; NU 3, Q. 18)
19. Under various overlapping outage conditions, the 1710 circuit could become overloaded. When generation reduction occurs at Bridgeport Harbor and Devon, certain 115 kV lines north of Devon could overload and exceed the short and long term emergency ratings, thereby creating critical situations and further outages. This shows the system is vulnerable under a wide range of loading conditions. (NU 1, pp. 6-7; Tables 2 and Table 3)
20. Preliminary results from a combined UI and NU study concerning planning for a 345 kV supply into southwest Connecticut indicate that there would not be a need for a 345 kV circuit until the turn of the century. (NU 3, Q. 18)

21. The 345 kV plan was replaced in 1982 with a plan to reinforce the existing 115 kV system with a new higher capacity system. The rebuild of the Plumtree-Ridgefield Junction 115 kV line was completed in 1985 (Council Docket No. 26). The application to rebuild of the Trumbull Junction-Old Town line is the next step in this plan. (NU 1, p. 4)
22. The 345 kV transmission system does not extend into the southwest region of Connecticut; therefore, to bring in the subject line at 345 kV would require the establishment of a 345 kV to 115 kV auto transformer substation. No substation development plans are included in the application. (NU 3, Q. 18; NU 1)
23. The proposed structures are not capable of supporting the bundled cables necessary for 345 kV transmission. The ground clearances and conductor insulation are not sufficient for the proposed line to be operated at 345 kV. (NU 3, Q. 14)
24. The growth rate of the area served by the Trumbull Junction-Old Town 115 kV line has averaged 2.8% annually for the period 1980-1985. (NU 3, Q. 18)
25. The growth rate in energy demand in the area served by the subject line is forecast to increase at an annual average rate of 3.7% for the period 1985-1989. (NU 3, Q. 18)
26. Actual summer and winter 1984 peak loads were above the 1984 Forecast projections. The 1985 Forecast predicts additional increases in loads in the area served by the 115 kV lines. The average annual area growth from 1985-1992 is forecast at a 3.0% rate. (NU 1, Appendix B, Table 1; revised).

27. The proposed rebuilding of the Trumbull Junction to Old Town Substation was included in NU's 1985 Forecast of Loads and Resources for 1985-1994. (NU 1985 Forecast of Loads and Resources, 1985-1994; Table III-5, p. III-22)
28. The 1985 NU Forecast of Loads and Resources indicated a summer peak average annual growth rate of 2.8% for the NU system. (NU 3, Q. 18; NU Forecast of Loads and Resources, Table I-2, p. I-8)
29. Reconstruction of the two circuits at the same time is appropriate and efficient. (NU 1, p. 4)
30. The present 1710 and 1730 circuits have a Long Term Emergency Rating (LTER) of 1145 amps. The Short Term Emergency Rating (STER) is 1200 amps. for a summer load. The proposed reconstructed line with 1590 kcmil ACSR cable would have summer ratings of 2585 amps. STER and 2205 amps. LTER respectively. Increasing the conductor size would increase the reliability of electric service. (NU 1, Table 3, p. 7-8)
31. The proposed rebuild of the subject line would help satisfy the need to reinforce reliable supply to the southwest Connecticut area until 1992. After that time, additional extensions might be necessary. (Tr. 2/25/86, pp. 57-58)
32. The existing easement ranges in width from 80 to 100 feet, adequate for the reconstruction. No acquisition of new land rights is necessary. The existing right-of-way is not wide enough to support any additional circuits in the future. (NU 1, p. ii; Tr. 2/25/86, p. 56)
33. The proposed reconstruction would replace the existing conductors and structures with heavier load-carrying conductors in order to

increase the current capacity but not the voltage of the transmission line. The line would remain at a 115 kV rating. (NU 1, p. ii, 5)

34. The proposed reconstruction would replace all the existing lattice tower structures with new steel pole structures on a one for one basis and reductor the line with six 1.5" - 1.75" diameter cables, 1590 kcmil or 1780 kcmil ACSR, respectively. (NU 1, pp. ii-iii)
35. Specifically, CL&P would replace 21 lattice steel structures with 18 double circuit steel pole structures, 4 single circuit steel pole structures, and 2 new lattice steel towers. Two existing steel pole structures at the Route 25 crossing would remain. (NU 1, pp. iii, 1)
36. New ACSR of 1½" to 1 ¾" diameter cable would replace the existing 15/16" diameter, 556.5 kcmil ACSR conductors. (NU 1, p. ii)
37. The two existing 3/8" diameter lightning shield wires would be replaced by two new 3/8" diameter wires. (NU 1, p. 2)
38. Because the proposed conductor would be larger and heavier than the existing conductor, the amount of sag in the line would be expected to increase slightly. (Tr. 2/25/86, p. 25)
39. Reconstruction would also provide an economic benefit by reducing NU's system losses and its need to run uneconomic generation. (Docket 26, Finding 56)
40. A 10'-15' increase in the average height of structures is necessary because of an increase in the mid-span clearance between the lowest conductor and the ground to provide for Connecticut

Department of Public Utility Control (DPUC) and National Electrical Safety Code (NESC) regulations, an increase in the amount of sag in the new conductor, and an increase in the vertical spacing between conductors. (NU 3, Q. 3)

41. The reconstructed line would comply with the NESC standards and the DPUC regulations covering method and manner of construction. It would not pose any undue hazards to person or property. (NU 1, p. 100)
42. UI would object to placing their distribution lines on the new structures, thereby creating a single line of structures. In order to consolidate the present lines, structures approximately 10-15 feet taller than the proposed units would be necessary to maintain the minimum distances between the conductors mandated by the NESC. (Tr. 2/25/86, pp. 14-23, 27)
43. NU and UI do not share tower space on any of their respective transmission lines. (Tr. 2/25/86, p. 20)
44. In several locations, the existing structures would be removed from interior sections of developed yards and replaced with the proposed structures farther from homes. (NU 1, pp. 17-18)
45. The proposed steel poles would be slimmer than the present structure and would have reduced visual effects. (NU 4, pp. 17-18)
46. Although continuous access along the right-of-way is not required, access would be needed to each new pole location in order to deliver materials, construct concrete formations, set the structures, install conductors, and remove existing towers and conductors. (NU 1, pp. 13-14)
47. There is good access to most structure locations because of the considerable development in the area of this line. (NU 1, p. 13)

48. Gravel roadways 12'-15' in width would be required for all long distance access locations. Dust control would be achieved by limiting the placement of gravel, topping with processed stone, and spraying gravel roads with water. (NU 3, Q. 5, 9)
49. As erosion control measures, processed stone would be used on the travelled portions of access roads, road edges would be seeded, water bars and culverts would be installed, and hay bale check dams employed where needed. (NU 1, p. 14)
50. One gap with no access road would be provided along each section of right-of-way between road crossings. Such gaps would be planned to favor lawn areas, wetlands, and steep slope areas. (NU 1, p. 14)
51. Equipment expected to be used on this project would include a 100 ton capacity crane, bulldozers, backhoes, compressors, rock drilling rigs, trucks, and flat bed trailers. (NU 1, p. 13)
52. NU anticipates there would be occasion for some blasting in areas of ledge outcroppings along the right-of-way. Such blasting would be conducted by a licensed blasting contractor. The contractor would follow the standard procedures for blasting in close proximity to homes, including pre-blasting surveys and seismic measurements during blasting. (Tr. 2/25/86, pp. 13-14)
53. Most work would be at or slightly above existing ambient sound levels near the right-of-way. Some equipment might on occasion result in noise levels in the 60-90dBA range near the right-of-way. (NU 3, Q. 8)

54. The area within one mile of the line contains developed and undeveloped areas and municipal parklands, residential, commercial, and industrial areas and transportation corridors. (NU 1, p. 10)
55. Much of the project area is in the Pequonnock River Watershed. No public or community water supply wells or reservoirs are located within 1000 feet of the project. No streams having stream channel encroachment lines are involved. (NU 1, p. 11)
56. The Pequonnock River is the only flood plain within the proposed project. Existing structure #843 is within the floodplain in Trumbull's Unity Park. NU would locate a replacement pole for this structure on higher ground, thus removing an existing structure from a wetland. (NU 1, p. 20)
57. Ten regulated wetlands or watercourses are located on the right-of-way, of which seven are in Trumbull and three are in Bridgeport. (NU 1, p. 20)
58. No more than three wetlands or watercourses would need to be crossed. Surge stone would be used to cross hard-bottom shallow wetlands, while corduroy roads and culverts would be used in deeper wetlands. (NU 1, p. 14)
59. The proposed work would present only a slight potential impact to the nearby wetlands and watercourses. (DEP letter of 1/22/86)
60. Foundation work and some structure work could be scheduled for the winter months of 1987 in order to lessen potential impacts on wetlands and recreation areas. (NU 3, Q. 7)
61. Some minor tree clearing would be necessary around some of the angle structure locations. This would be done selectively, only after construction has begun. (NU 3, Q. 2)

62. The herbicide to be used would be Tordon RTU. The use of this herbicide would be limited to tree stumps. (Tr. 2/25/86, p. 12)
63. Final rehabilitation would restore project areas to as near the condition prior to construction as possible. Rehabilitation efforts would include raking and seeding of access ways, installing waterbars, removing culverts, restoring stream crossings to final stable conditions, and installing gates and barriers. Specific locations would be addressed in the D&M Plan. (NU 3, Q. 4)
64. The existing 1730 circuit conductors could be transferred to the new structures by 1988, instead of replacing the conductors. However, adverse environmental, electrical, and safety impacts could be expected because the 1730 conductors have been compressed and strained at the clamp locations. These areas may have loose stranding and/or rough surfaces which could create radio/TV interference and actual cable strand failures. (NU 1, p. 4-5)
65. There are no system alternatives involving reconstruction of other CL&P 115 kV facilities, substation load transfers, circuit configuration changes, or system operational alternatives that could delay the need to reconstruct the Trumbull Junction-Old Town Line. (NU 1, p. 7)
66. Alternative overhead and underground lines are not economically practical. An underground 115 kV transmission line would be approximately six times the construction cost of the existing line. (NU 1, p. iii, 2; NU 4, p. 19)
67. The estimated cost to complete the reconstruction of the line is \$4.2 to \$5.0 million. (NU 1, p. ii, 2)

68. The estimated unit material costs for conductor supporting structures (1986\$) are as follows:

1590 kcmil ACSR lattice anchor tower	\$44,000;
1590 kcmil ACSR steel pole structure	\$29,000;
1780 kcmil ACSR lattice anchor tower	\$52,000; and
1780 kcmil ACSR steel pole structure	\$35,000;

(NU 3, Q. 13)

69. The sizes of the cables studied for this line were: 1272, 1590, 1780, and 2156 ACSR. Because of the loads involved, the 1590 ACSR was considered the most economical. (Tr. 2/25/86, p. 26)

70. The estimated cost for each of the two cable options is as follows:

\$1.80/ft for 1590 ACSR (1986\$); and  
\$2.10/ft for 1780 ACSR (1986\$).

The estimated total direct cost of each installed circuit of three conductors and one overhead lightning shield wire (3.1 miles) is

\$312,000 for 1590 ACSR (1986\$); and  
\$350,000 for 1780 ACSR (1986\$).

(NU 3, Q. 12)

71. An alternative to the proposed reconstruction would be the addition of a second UI line from Pequonnock to Ash Creek Junction at a cost approximately \$1.5 to \$2.3 million more than the proposed rebuild.

(NU 1, p. 8)

72. CL&P representatives met with municipal officials in Bridgeport and Trumbull and with Lake Forest Neighborhood Association to discuss local concerns regarding the subject line. (NU 1, p. 2)

73. UI would not be responsible for any line work but would be responsible for work and costs attendant to increasing the through-flow capacity of UI's Old Town Substation and other changes at the Hawthorne and Pequonnock Substations. (NU 3, Q. 15)

74. The insurance liability for damage done to houses by blasting would entitle homeowners to be made whole by the blasting firm. The contract with the blaster carries an indemnification insurance provision which requires the blaster to have insurance to cover both the blaster and NU. There would be compensation available for damage done by blasting. (Tr. 2/25/86, p. 23)
75. No designated or eligible historic and archaeological resources were identified as being adversely affected by the project. No designated scenic areas or airports are located within one mile of the line. (NU 1, p. 10)
76. There are no known records of endangered or threatened species or critical habitats that would be effected by the proposed project. (NU 3, Q. 11)
77. The proposed facilities would be consistent with the Federal Power Commission's Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the design and location of rights-of-way and transmission facilities. (NU 1, Appendix A, p. 2)
78. The scheduled in-service date is May 1988. Detailed engineering, material acquisition, and regulatory approvals and construction would require approximately 20 months after Council certification. (NU 1, p. ii)