DOCKET NO. 149 - An application of the United Illuminating Company (UI) for a Certificate of Environmental Compatibility and Public Need to erect a new 115,000/13,800 volt substation located at 260 Railroad Avenue, West Haven, Connecticut, and to modify two existing 115,000 volt overhead transmission lines to connect this substation to UI's transmission system.

: Connecticut
: Siting
: Council

August 4, 1992

FINDINGS OF FACT

ORIGINAL

Introduction

1. On February 10, 1992, in accordance with sections 16-50g through 16-50z of the Connecticut General Statutes (CGS) and section 16-50j-1 et seq. of the Regulations of Connecticut State Agencies (RSA), the United Illuminating Company (UI) submitted to the Connecticut Siting Council (Council) an application for a Certificate of Environmental Compatibility and Public Need for construction, operation, and maintenance of a new 115,000/13,800 volt substation at 260 Railroad Avenue, West Haven, Connecticut, and to modify two existing 115,000 volt overhead transmission lines to connect the proposed substation to the UI transmission system (Project). (UI 1, p. 1)

2. Pursuant to CGS section 16-50l(b), UI published notice of the application in The New Haven Register on February 6 and 7, 1992. (UI 2)

3. Pursuant to CGS section 16-50m, the Council, after giving due notice thereof, held a public hearing on the proposed Project on April 29, 1992, beginning at 3:00 p.m. and reconvening at 7:00 p.m., in the West Haven City Hall, 355 Main Street, West Haven, Connecticut. (Public Hearing Notice, March 13, 1992; Transcript (Trans.) Afternoon, May 29, 1992; Trans. Evening, May 29, 1992)

4. The Council and its staff made a field inspection of the proposed Project site in West Haven, Connecticut, on April 29, 1992. (Public Hearing Notice, March 13, 1992)

Need

5. The need for an additional bulk substation in the Allings Crossing Road area of West Haven, Connecticut, between the existing Elmwest and Woodmont substations was identified by UI in their March 1, 1991 and 1992, "Report(s) to the Connecticut Siting Council." (UI 1, Ex. G, p. III-13; Council Administrative Notice item 4, pp. III-10, 12)

6. The forecasted compound annual growth rate from 1992 to 1995 for the existing Elmwest substation is 3.16 percent. At this compound annual growth rate, the Elmwest substation is expected to exceed its supportable loading by summer peak, 1994. Woodmont substation's supportable load can be expanded in the short term by replacing existing transformers with larger capacity transformers; however, this option is not possible for Elmwest substation because it already has the largest capacity bulk substation transformers in the UI system. (UI 1, Ex. A, p. 2; UI 1, Ex. C, p. 2:1; Trans. Evening, pp. 18-19)

7. Additional conservation and load management (CLM) programs performed by UI would not eliminate the need for the proposed Project. If additional CLM programs in the Allings Crossing Road area could achieve a three megawatt reduction per year, the need for the Project would be postponed by one year. (Trans. Afternoon, pp. 56-57)

8. UI considered the following three alternatives to constructing a new bulk substation:

    1. Do nothing;
    2. Transfer load to other existing substations; or
    3. Expand the existing Elmwest substation.

    The first alternative would not provide an adequate and reliable supply of electricity. The second alternative would not be possible because no distribution transfers could be made that would alleviate or delay the need for a new bulk substation in the Allings Crossing Road area. The third alternative would not be possible because of increased distribution costs and losses that would occur as well as the limited (0.24 acre) amount of space available for expansion at Elmwest substation. (UI 1, Ex. A, p. 2; UI 1, Ex. C, p. 3:1; UI 3, Q. 6)

9. If the proposed Project were not constructed to provide increased capacity for system reliability, UI's distribution losses over the 1994-2002 time period would be approximately 5700 megawatt-hours. The megawatt-hour savings attributable to the Project would result in a cumulative nominal savings of $230,000 over the 1994-2002 time period. (UI 3, Q. 11)

Site Search

10. During the search for a substation site, UI considered existing transmission and distribution facilities; possible new transmission and distribution requirements; long-range community development plans; existing land use; environmental effects; and economic and engineering viability. (UI 1, Ex. C, pp. 3:1-2)

11. In 1980, UI identified 12 possible future substation sites in the Allings Crossing Road area and added another site for consideration in 1989. In 1989, UI found that four of the sites had been developed since 1980; one site was less than the one acre necessary for the proposed bulk substation; four sites were unavailable for purchase; two separate sites, available only as a pair, would have affected existing residences on one of the parcels as well as increasing distribution construction costs by approximately 1.0 million dollars; and one site was marginal in size and would have increased distribution construction costs by approximately 1.3 million dollars. (UI 1, Ex. C, p. 3:2-4; UI 3, Q. 6-8)

Proposed Site

12. The site proposed by UI to serve the Allings Crossing Road area with a bulk substation is located at 260 Railroad Avenue. The 1.94 acre parcel is zoned light industrial/manufacturing and is located within an established industrial area along the Interstate 95 (I-95) and Connecticut Department of Transportation (DOT) railroad right-of-way (ROW). The northbound lanes of I-95 are approximately 150 feet northwest of the site. The DOT railroad ROW immediately adjacent to the south of the site, has four tracks with 60 foot above ground level catenary structures, and is used by diesel and electric passenger and freight trains. The proposed site contains a one story, 27,500 square foot warehouse/office building with a billboard on its roof, a railroad siding, and a paved and gravel/dirt parking/driveway area. (UI 1, Ex. C, pp. 2:3, 12; UI 1, Ex. C, pp. 4:1, 12-14; UI 1, Ex. C. Fig. 5:1)

13. The City of West Haven Zoning Regulations permit substations as of right in light industrial/manufacturing zones. West Haven City officials have indicated their support for the proposed Project. (UI 1, Ex. H; UI 3, Q. 1; Trans. Evening, pp. 22, 24)

14. The following land use structures are located within 500 feet of the property lines of the proposed Project site:

Land Use Structures	Number within 500 feet	Closest Distance/Direction from Project
Residential units	15	300 feet (south)
Office buildings	0	550 feet (northwest)
Industrial/ Manufacturing	3	Adjacent (west)
Commercial (Hotel)	1	400 feet (north)
Recreational areas	0	1200 feet (south)

(UI 1, Ex. C, pp. 4:7-13; UI 3, Q. 5)

Existing Site Conditions

15. Groundwater depth at the proposed Project site ranges from five to seven feet and flows underneath the site in a southeasterly direction. The groundwater quality on the site is classified as GB, and as such may not be suitable for human consumption. (UI 1, Ex. C, p. 4:2)

16. Soils and groundwater at the proposed substation site were contaminated with benzene, 1,1-dichloromethane, and trichlorofluoromethane in the parts per billion range. The primary cause of the contamination was the failure or improper abandonment of on-site underground storage tanks. The underground storage tanks and contaminated soils have been removed, thereby removing the on-site sources of groundwater contamination. Small concentrations of 1,1,1-trichloroethane were also found in the groundwater; however, this contaminant is from an off-site source. (UI 1, Ex. B, p. 4; UI 1, Ex. C, p. 4:7; UI 3, Q. 18)

17. Two drainage ditches are located on the proposed substation site. The first is an earthen swale that runs north to south adjacent to the site's western boundary line, coincident with a 36-inch stormwater sewer. The other drainage ditch follows the railroad siding along the eastern side of the property, and parallels the DOT railroad ROW along the southern property line before converging with first ditch near the southwest corner of the property. The eastern ditch has been classified by the City of West Haven Inland Wetlands Agency as a watercourse. The drainage ditches and stormwater sewers are hydrologically connected to Phipps Lake to the south by a culvert under the DOT railroad ROW. (UI 1, Ex. C, p. 4:3)

18. A culvert located under the DOT railroad ROW that serves the drainage ditches located on the proposed Project site is blocked. This blockage has caused ponding to occur along the southern edge of the site. This area has been ponded for at least three years. Common reeds (Phragmites communis), indicators of stress in wet areas, are found in the ponded area. (UI 1, Ex. C, p. 4:2; Trans. Afternoon, pp. 29, 39)

19. The Army Corps of Engineers (Corps) 1987 manual identifies the following three criteria for wetland designation: 1) standing water, 2) vegetation, and 3) soil characteristics. The proposed substation site has a ponded area and common reeds (Phragmites communis) which are indicators of stress in wet areas. No soil borings were done to identify soil types for wetlands. (Trans. Afternoon, pp. 38-39, 41)

Proposed Equipment

20. The proposed substation would consist of a single story control/switchgear building built to house 13,800 volt indoor metal clad switchgear and protection, control, and metering equipment. The metal clad switchgear would be supplied by the 115,000/13,800 volt transformers located in the switchyard and would include circuit breakers and termination facilities for 12 initial distribution feeders. The control/switchgear building would have sanitary facilities served by a new sanitary sewer connection. The outside of the building would be painted a light tan with light grey doors. (UI 1, Ex. A, p. 4; UI 1, Ex. C. p. 2:3; UI 3, Q. 4; Trans. Afternoon, p. 64)

21. The proposed substation would initially be served by two 115,000/13,800 volt transformers providing the substation a nominal distribution rating of 58 megavoltamps (MVA). Based on current load projections, the proposed substation would exceed its 58 MVA initial nominal distribution rating in the year 2006. Prior to the substation exceeding its initial nominal distribution rating, two additional 115,000/13,800 volt transformers, associated disconnect switches, and buswork would be placed in the substation yard and circuit breakers and termination facilities for 12 additional distribution feeders would be placed inside the control/switchgear building. The second set of transformers would provide the substation with a maximum nominal distribution rating of 116 MVA. (UI 1, Ex. A, p. 5; UI 1, Ex. C, p. 2:3; UI 3, Q. 9)

22. Each transformer at the proposed substation would contain approximately 7300 gallons of oil. The oil would have a PCB concentration of less than one part per million. Each transformer would have an oil containment basin consisting of a crushed stone filled pit with either compacted clay or concrete floors. Each basin would be designed to contain 110 percent (8030 gallons) of the transformer oil in order to account for a worst case leak and any rainwater in the basin. Perforated drainage piping would be installed at the bottom of each basin and connected to a drainage sump for removal of rainwater or oil. If a spill occurred, the oil would be pumped out and properly disposed of, the stone would be removed, the walls and floor of the containment basin would be cleaned, and the stone would be replaced. (UI 1, Ex. B, p. 5; UI 3, Q. 14; Trans. Afternoon, pp. 50, 71-72)

23. With the initial two transformers in place, approximately 1300 feet of distribution ductline, approximately 2500 feet of three conductor cable, and three manholes would be needed to tie the proposed substation into UI's distribution system. (Trans. Evening, p. 18)

Tranmission Line Modifications

24. The proposed substation would be interconnected to UI's transmission line system via the existing 115,000 volt transmission lines constructed on catenary structures over the railroad tracks. The modifications would occur entirely on UI property and the DOT railroad ROW. (UI 1, Ex. C, p. 2:7)

25. The proposed overhead modifications tying the proposed substation to the existing 115,000 volt transmission lines would utilize three single shaft, self-supporting, painted tubular steel structures approximately 70 to 75 feet tall, and two H-frame steel painted structures approximately 70 to 80 feet tall. (UI 1, Ex. C, p. 2:7)

26. The proposed overhead transmission line modifications would be designed to operate at 115,000 volts phase to phase. The transmission conductors would be 1272 kcmil, 45/7 steel supported aluminum core, approximately 1.345 inches in diameter. A 4/0 shield wire and an optical fiber ground wire (OPGW), approximately 0.6 inches in diameter, would be installed between the proposed substation and the existing catenary structures. New OPGW would be installed between UI's Woodmont substation in Milford, Connecticut, and UI's Water Street substation in New Haven, Connecticut. The new OPGW would be installed overhead on the catenary structures from Woodmont substation to UI's West River substation in West Haven, Connecticut, replacing an existing 4/0 copper shield wire on the north side of the DOT railroad ROW. The new fiber optic connection would continue from the West River substation to the Water Street substation via an existing underground duct. The OPGW and fiber optic cable would provide communication channels for protection relaying purposes between the proposed substation and existing substations. (UI 1, Ex. C, pp. 2:7, 12)

Construction Details

27. Prior to construction of the proposed Project, UI would remove the existing warehouse. Before dismantling and razing the warehouse, UI would remove asbestos from the building, remove and cap the existing sanitary sewer pipe, and remove the existing rooftop billboard. (UI 1, Ex. C, p. 2:14; UI 4, Q. 20; Trans. Afternoon, p. 65)

28. Prior to any asbestos removal at the proposed Project site, UI would provide notice to the Federal Environmental Protection Agency (EPA). DEP's Waste Engineering and Enforcement division would have to review and approve UI's asbestos disposal plan prior to any asbestos removal. (DEP Commissioner Keeney letter to Council Chairman Gelston, March 20, 1992; Trans. Afternoon, p. 20)

29. Although all sources of soil and groundwater contamination at the proposed Project site have been removed, UI would continue to test the soil for contamination and remove such soil if found to be contaminated. UI would grade the site to a uniform level with clean imported fill if needed, and use siltation fences and/or hay bales to control erosion and sedimentation. DEP would conduct a formal review of UI's plans for excavation, stockpiling, testing, and treatment/disposal of soils prior to construction. (UI 1, Ex. C, pp. 5:1, 5; Trans. Afternoon, pp. 19, 49, 51)

30. The proposed substation yard would be finished with six inches of crushed rock, an eight-foot by twenty-foot ornamental gate at the entrance, and a fourteen foot chain link security fence around the substation yard. The finished grade of the substation yard would be approximately 78 feet above mean sea level. The north side of the parcel facing Railroad Avenue would be landscaped. (UI 3, Q. 3)

31. Groundwater encountered during construction of the proposed Project would be discharged into the sanitary sewer adjacent to the site. If groundwater could not be discharged to the sanitary sewer, it would be treated and disposed of on site. Discharge to the sanitary sewer would require approval from the City of West Haven and a discharge permit from DEP. (Trans. Afternoon, pp. 20, 32, 52)

32. Approximately 0.3 acres of vegetation, mostly along the DOT railroad ROW along the southern part of the proposed Project site, would be cleared. The 0.3 acres would include the removal of approximately 150 trees, three inches in circumference or greater; however, some trees could be saved if they were low-growing species. (UI 1, Ex. C, p. 5:3; UI 3, Q. 13; Trans. Afternoon, p. 47)

33. Access to the proposed Project during construction would be via Railroad Avenue, Allings Crossing Road, and Connecticut Route 162. These access roads would be able to accommodate the temporary increase in traffic flow during construction. (UI 1, Ex. C, pp. 5:7-8)

34. During construction, the proposed Project site would be able to accommodate off-street parking and equipment/material lay-down areas. (UI 1, Ex. C, p. 5:8)

35. Prior to construction of the proposed Project, UI would apply for a permit from the City of West Haven Department of Public Works for distribution line work and driveway and sidewalk/curb repair. The permit would consider traffic maintenance and control for vehicles and pedestrians. (UI 1, Ex. C, pp. 5:8-9)

Environmental Effects

36. The proposed substation would be partially screened by the control/switchgear building to the north; the existing industrial/manufacturing buildings on the east and west; and the topography, trees, and DOT railroad ROW to the south. (UI 1, Ex. B, p. 5; UI 1, Ex. C, p. 5:9; Trans. Afternoon, p. 66)

37. Preservation of the ponded area and low growing vegetation on the southern portion of the proposed Project site would provide further screening to visual receptors to the south. (Trans. Afternoon, p. 34)

38. The acoustic environment in the area of the proposed Project site is dominated by I-95 traffic noise. The prominent noise at the proposed substation would be from the cooling fans and the 60 cycle hum of the 75dBA transformers. (UI 1, Ex. C, p. 4:18; UI 1, Ex. C, p. 5:14; Trans. Afternoon, pp. 16-26)

39. The following noise level estimates for the proposed substation are based on four transformers operating at their maximum MVA rating which would require full operation of auxiliary cooling pumps and fans:

Location	Four Transformers	DEP Noise Standard
Eastern property line	67 dBA	70 dBA
Western property line	67 dBA	70 dBA
Boundary between substation and residential zone to south	47 dBA	51 dBA (Nighttime standard)

The transformers are expected to operate below their self-cooling rating of 24 MVA most of the time, thereby resulting in lower decibel levels. However, if the noise generated by the substation exceeded allowable limits, UI would place sound absorbing barriers between the transformers and the property lines as well as between the firewalls and building walls adjacent to the transformers. (UI 1, Ex. C, pp. 5:13-14; UI 3, Q. 15-16; Trans. Afternoon, pp. 15-17)

40. Existing and proposed transmission line magnetic field values measured in milliGauss (mG) were calculated at the following locations and amperage levels near the proposed substation:

A) Edge of DOT railroad ROW near closest residence:

Line loading	Amps	Existing	Proposed
Typical Load	550	11 mG	10 mG
Normal Rating	1901	39 mG	33 mG
Long-Term Emergency Rating	2233	46 mG	39 mG
Short-Term Emergency Rating	2482	51 mG	43 mG

B) Property line of closest industrial/commercial building (adjacent western property):

Line loading	Amps	Existing	Proposed
Typical Load	550	Less than 1 mG	5 mG
Normal Rating	1901	Less than 1 mG	16 mG
Long Term Emergency Rating	2233	Less than 1 mG	18 mG
Short Term Emergency Rating	2482	Less than 1 mG	20 mG

(UI 3, Q. 19)

41. Existing and proposed transmission line electric field values measured in kilovolts per meter (kV/m) were calculated for the following locations near the proposed substation:

A) Edge of DOT railroad ROW near closest residence:

Existing	Proposed
0.22kV/m	0.22 kV/m

B) Property line of closest industrial/commercial building (adjacent western property):

Existing	Proposed
Less than 0.01 kV/m	1.4 kV/m

The existing and proposed values include all loads and ratings. (UI 3, Q. 19)

42. The possibility of adverse health effects associated with electric and magnetic fields (EMF) cannot be ruled out; however, adverse health effects associated with EMF have not been demonstrated at this time because a cause and effect relationship has not been shown. The State of Connecticut has not established any standards for magnetic or electric fields. (Council Administrative Notice, Report to the Connecticut Legislature by the Task Force Studying Electric and Magnetic Fields: An Interim Report; UI 1, Ex. B, p. 2; UI 1, Ex. C, pp. 5:14-15)

43. No known historic, architectural, or archeological resources would be affected by construction of the proposed Project. (UI 1, Ex. C, p. 5:10; UI 1, Ex. F)

44. No State or federally listed or proposed to be listed, threatened, endangered, or species of special concern, plant or animal would be affected by construction of the proposed Project. (UI 1, Ex. C, p. 4:6)

Schedule and Cost

45. After receiving all necessary permits and approvals and coordinating with DOT for railroad work, UI would begin construction of the proposed Project during the first quarter of 1993. Construction of the Project would be completed by the second quarter of 1994 followed by testing and energizing. (UI 1, Ex. A, p. 5; UI 1, Ex. C. p. 5:8; UI 1, Ex. D)

46. The following is an estimated cost breakdown in 1994 escalated dollars of the proposed Project:

Project management.	$ 467,000
Environmental management.	200,000
Protection and control.	2,098,000
Substation, including site remediation and building demolition	4,807,000
Transmission line interconnection	681,000
Distribution line construction.	526,000
Overhead and contingencies.	1,664,000
Fiber optic cable	337,000
TOTAL	$10,780,000

(UI 1, Ex. A, p. 5; Trans. Afternoon, p. 59)

47. An underground transmission line interconnection from the proposed substation to the existing 115,000 volt transmission lines would cost eight to ten times greater than the proposed overhead interconnection. (UI 1, Ex. C, p. 3:5)

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