ORIGINAL

DOCKET NO. 159 - An application of the Department of Public Safety, Division of State Police, for a Certificate of Environmental Compatibility and Public Need for the construction, operation, and maintenance of telecommunications facilities located off of Bald Hill Road at an existing Northeast Utilities tower site approximately 2,000 feet north from Route 190 in Union, and at the new Troop C Barracks on Route 74 approximately 2,500 feet west from Exit 69 off of Interstate 84 in Tolland, Connecticut.

: Connecticut

: Siting

: Council

: June 29, 1993

FINDINGS OF FACT

1. On February 1, 1993, the Connecticut Department of Public Safety, Division of State Police (CSP), pursuant to sections 16-50g to 16-50z of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) for a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, operation, and maintenance of telecommunications facilities in Union and Tolland, Connecticut. (CSP1, Tab 5, p. 1)

2. The proposed facilities are within the CSP Troop C service area which includes the Towns of Somers, Stafford, Union, Ashford, Willington, Tolland, Vernon, Ellington, Coventry, and Mansfield, Connecticut. (CSP5, Q. 3)

3. Pursuant to CGS section 16-50m, the Council, after giving due notice thereof, held a public hearing for the proposed facilities on April 1, 1993, beginning at 3:00 p.m., and continued at 7:00 p.m., in the Lecture Hall, Tolland Middle School, Old Post Road, Tolland, Connecticut. (Council Hearing Notice; Transcript (Tr.))

4. The Council and its staff inspected the proposed sites on April 1, 1993, prior to the hearing. High winds on April 1, 1993, prevented balloons to be flown at the sites to simulate the height of the proposed towers. Upon request of two landowners who reside near the proposed CSP Union facility site, the CSP agreed to raise a balloon at this site. The Council Chairman and staff attended the reflying of the balloon on April 8, 1993. (Council Hearing Notice; Tr. Evening, p. 124; CSP letter to Chairman Gelston, April 6, 1993)

Existing CSP Telecommunications System

5. The CSP currently uses a low-band, voice-only, two-way radio system that was implemented in the 1940s. Although the existing two-way radio system has been upgraded over the years, it is compromised by technical and physical factors including, but not limited to co-channel interference, "skip" interference (interference from other radio systems), lack of encryption capability, lack of additional frequency availability, and physical plant age. (CSP1, Tab 2, pp. 1-3; CSP1, Tab 9, pp. 2-5)

6. The CSP currently leases copper telephone landlines from the Southern New England Telephone Company (SNET) to provide all point-to-point data communications. The existing point-to-point limitations include, but are not limited to, lack of capacity for system growth, inability to configure system for tactical and emergency situations, and incompatibility with state-of-the-art two-way mobile radio systems. (CSP1, Tab 8, p. 1; CSP1, Tab 9, p. 1)

Proposed CSP Telecommunications System

7. The CSP is proposing to replace the existing low-band, voice-only, two-way radio system on a statewide basis with a new 800 megaHertz (MHz), trunked, two-way radio system. The new system would provide state-of-the-art communications capabilities to the CSP. Additional 800 MHz frequencies have been released by the Federal Communications Commission (FCC) for use by public safety organizations. Frequencies in the 800 MHz range are not subject to co-channel or skip interference and have the capability for encryption and use of mobile data terminals. (CSP1, Tab 11, pp. 3-4; CSP1, Tab 12, p. 14)

8. The proposed CSP statewide 800 MHz two-way radio system has been designed to provide 95 percent coverage 95 percent of the time for mobile units and 90 percent coverage 90 percent of the time for portable units. (CSP1, Tab 12, p. 14)

9. The CSP is proposing a statewide digital microwave radio network to provide point-to-point data communications. The digital microwave network would provide radio control, voice and data circuits, high transmission speeds, system reconfiguration capability, and expansion capacity. The digital microwave system would also enable all base stations in a Troop area to simultaneously broadcast to all base stations on the same frequency (SIMULCAST) and act as a single base station. (CSP1, Tab 11, p. 2; CSP1, Tab 12, p. 12)

10. The CSP digital microwave system has been designed to meet or exceed the Bell System Standard for microwave services, with system outages due to propagation failures not to exceed one hour per year (99.99 percent reliability) during the busiest hour of the busiest week of the year. To achieve this objective, the average outage time of each path must not exceed five and one-half minutes per year (99.999 percent reliability). (CSP1, Tab 12, pp. 8-9; Tr. Afternoon, p. 49)

11. The CSP considered and rejected an enhanced low-band two-way radio system as an alternative to their proposed 800 MHz trunked two-way radio system. An enhanced low-band system would not be able to avoid the various problems associated with the existing low-band system. (CSP1, Tab 11, p. 3)

12. The CSP considered and rejected the following alternatives to its proposed statewide digital microwave network:

Alternatives	Reasons for Rejection
Copper wire landlines	o would not support numbers of channels or transmission speeds required for digital date transmission
	o would not support SIMULCAST
	o would be susceptible to landline related outages
Satellites	o could not presently meet needs of mobile communications
	o would not be compatible with trunking
Fiber Optics	o would incur expensive installation costs
	o would be susceptible to landline related outages
Private leased networks	o would increase costs
	o would lose budgetary and managerial control
Analog microwave	o would not provide higher data transmission speed, system expansion, and intelligent networking available with a digital network.

(CSP1, Tab 11, pp. 1-2)

Proposed Union Site

13. The proposed CSP Union site is located within a 0.23 acre parcel zoned rural/residential by the Town of Union. The parcel, owned by Mr. Sherwood Bauer, is the current location of an existing fenced 50-foot by 50-foot telecommunications site with an existing 40-foot above ground level (AGL) wood pole with three antennas, equipment building, and above ground propane tank owned by Northeast Utilities (NU). There are no residences within 1000 feet of the site. The elevation of the proposed site is 1260 feet above mean sea level (AMSL). (CSP1, Tab 13D, p. 1; CSP1, Tab 14 Union, pp. 1, 8; CSP5, Q. 1)

14. The CSP would use the existing NU facility right-of-way to access the proposed CSP Union facility site. (CSP1, Tab 13D, p. 1; CSP5, Q. 2)

15. A new 18-foot by 41-foot single story equipment shelter would house the CSP and the Town of Union's telecommunications equipment at the proposed Union site. The existing 18-foot by 10-foot equipment building used by NU would be expanded to 18-feet by 20-feet. Buried utilities would be brought to the shelter. The shelter would have full environmental controls, including air conditioning. The shelter would house a 49 kilowatt (KW) generator to power the equipment in the event of an electric power failure. A 1000-gallon liquid propane tank would be buried on site to supply the generator with three days of fuel. The CSP would remotely test the generator for approximately ten to 15 minutes per week. Batteries housed in the shelter would provide additional back-up to the generator. On-site alarms would alert CSP personnel at the barracks to conditions in the shelter including a breach of the building, high temperature, smoke, and propane leaks. (CSP1, Tab 12, pp. 2-6; CSP1, Tab 13D, p. 1; CSP1, Tab 14 Union, pp. 2-3, 10; CSP5, Q. 2)

16. Radio equipment operation at the proposed CSP Union facility would be remotely monitored. In the event of main-unit radio equipment failure, hot-standby equipment would be automatically switched on. (CSP1, Tab 12, p. 9)

17. The tower proposed for the CSP Union facility would be a 180-foot AGL, self-supporting, three-legged lattice tower approximately 27.5 feet at the base, tapering to eight and one-half feet at the top. In accordance with the Electronic Industries Association Structural Standards for Steel Antenna Towers and Antenna Supporting Structures EIA-222-E, the tower would be designed to maintain its integrity at 90 miles per hour with one-half inch of radial ice. (CSP1, Tab 13E, p. 1)

18. For the proposed Union facility, the CSP is proposing to expand the existing NU site to 100-feet by 100-feet. The site would be fenced by an eight-foot high chain-link security fence. Access to the site would be via a three-foot wide personnel gate and a 14-foot wide double-leaf gate. Only minor grading and excavation would be necessary for the proposed site expansion. (CSP1, Tab 13D, p. 1; CSP1, Tab 14 pp. 7, 11; CSP5, Q. 2)

19. The CSP has planned to place eight of its own antennas, eight NU antennas, and one antenna from the Town of Union on the proposed Union tower at heights ranging from 70 feet AGL to 180 feet AGL. The overall height of the tower with antenna structures would be approximately 195 feet AGL. (CSP1, Tab 13F, p. 4; CSP1, Tab 13J, p. 1)

20. The Federal Aviation Administration (FAA) has indicated to the CSP that lighting and marking of the proposed Union tower may be necessary because of its overall height AMSL within an air traffic vector. Any tower at the proposed site taller than 89 feet AGL may require FAA lighting and marking. The CSP can apply to the FAA for an amendment to waive the lighting and marking requirements. (CSP1, Tab 13L, p. 1; Tr. Afternoon pp. 17-18, 22)

21. The proposed CSP Union facility has been designed to provide a microwave link between CSP sites in Thompson and Storrs, Connecticut. The minimum tower height at Union that would be needed for adequate microwave path clearance between the CSP Union and Thompson facilities is 180 feet AGL. To achieve a microwave link between Union and Storrs the CSP need a minimum tower height at Union of 100 feet AGL. The facility would also provide 800 MHz service to the Troop C area and portions of Troop D. (CSP1, Tab 13C, p. 1; Tr. Afternoon, pp. 26-27, 40; CSP5, Q. 3, 7)

22. Establishment of a CSP Union-Thompson microwave link would close a loop in the CSP microwave backbone plan. Closure of loops is not required for the CSP to meet the Bell System Standard for path reliability. The CSP has planned to exceed the Bell System Standard for path reliability by constructing path redundancy. (Tr. Afternoon, pp. 34-36)

23. The CSP would require a 130-foot AGL tower at the proposed Union site and an approximately 150-foot AGL tower (versus the planned 140-foot AGL tower) at the CSP Ekonk Hill site in order to achieve a microwave link between the two sites. The use of two microwave dishes versus one dish would be required to provide a microwave link for any distance exceeding 26 miles. The Union-to-Ekonk Hill link would be approximately 28 miles. (CSP6, Q. 20)

24. Establishment of a CSP Union-Ekonk Hill link would close a microwave path loop, but would leave the CSP Thompson facility without a redundant microwave link. Failure of the CSP Thompson facility would eliminate the only microwave link to CSP Troop D. (CSP1, Tab 13A, pp. 1-2)

25. A monopole tower as an alternative to the proposed CSP Union 180-foot AGL self-supporting lattice tower would have an eight-foot diameter base tapering to a three-foot diameter top. The CSP rejected a monopole alternative because of increased costs associated with monopoles and the difficulty associated with adding additional antennas to the tower if the need arose. (CSP1, Tab 12, p. 7; Tr. Evening, p. 129)

Environmental

26. Trees at the proposed CSP Union facility site have been cleared in conjunction with the existing NU facility at the site. Minimal clearing of understory vegetation, the removal of three trees of approximately 20 inches diameter at breast height, and the removal of two, two-inch to four-inch diameter saplings would be required to expand the existing site. (CSP1, Tab 14 Union, pp. 7, 11)

27. The proposed CSP Union facility site is located within a public water supply watershed. The groundwater at this site is classified GAA and is presumed suitable for direct human consumption without treatment. There are no wetlands or watercourses at the site. (CSP1, Tab 14 Union, p. 7; CSP5, Q. 4)

28. Existing tree heights in the area of the proposed CSP Union facility site range from 45 feet to 55 feet AGL in the vicinity of the site to 75 feet to 80 feet AGL off the crest of the hill on which the site is located. The tower would be partially visible above the trees from all directions, including portions of Interstate 84. (CSP1, Tab 14 Union, pp. 14-15; CSP5, Q. 6, 12)

29. There are no known extant populations of federal or Connecticut endangered and threatened species or species of special concern to Connecticut at the proposed CSP Union facility site. (CSP1, Tab 14 Union, Ex. E)

30. The proposed CSP Union facility would not generate solid waste or toxic substances. Air emissions from the running of the emergency generator would not have a significant effect on air quality in the region. The noise of the emergency generator and the equipment shelter environmental controls would only affect ambient noise levels in the immediate area of the site. (CSP1, Tab 14 Union, pp. 4-5, 7-11)

31. The proposed CSP Union facility would have no effect on historic, architectural, or archeological resources. (CSP1, Tab 14 Union, Ex. E)

32. The total maximum radio-frequency power density level for the proposed CSP Union facility would be approximately 0.596 percent of the maximum exposure limit as established by the American National Standards Institute (ANSI) in 1982 and adopted by the State of Connecticut pursuant to CGS section 22a-162. (CSP1, Tab 13N, p. 2)

33. The total maximum radio-frequency power density level for the proposed CSP Union facility would be approximately 2.85 percent of the 1991 revision of the ANSI 1982 guidelines for maximum exposure. (CSP6, Q. 22)

Schedule and Costs

34. The construction of the proposed CSP Union facility would begin in the second quarter of fiscal year 1993-1994. (CSP1, Tab 13 Q, p. 2)

35. The estimated total CSP cost of the proposed Union facility is as follows:

Radio equipment	$657,500
Antennas	69,400
Power systems	44,500
Site preparation, Access road, and equipment shelter	103,400
Miscellaneous	65,500
Total	$940,300

NU would supply the 180-foot AGL self-supporting lattice tower. (CSP1, Tab 13P, p. 1; CSP5, Q. 11)

Alternative Sites

36. The CSP considered and rejected the following three alternative sites to the proposed Union facility site: two on property owned by the Huling family of Union and one at an existing facility tower site in Union owned by Continental Cablevision in Union. (CSP15, pp. 1-2)

37. Both Huling property sites were rejected by the CSP as alternatives to the proposed Union facility site because of the need to purchase or lease property, access, and utility rights-of-way and the need for extensive clearing of trees along the access road and utility right-of-way of approximately 3500 feet. (CSP6, Q. 21)

38. The CSP rejected the Continental Cablevision site because of additional costs and the unwillingness of representatives from Continental Cablevision to discuss terms for use of the site. (CSP9; Tr. Afternoon, pp. 51-57)

39. A CSP facility at the Continental Cablevision site would likely require FAA marking and lighting. (Tr. Afternoon, p. 24)

40. The CSP has estimated that the additional cost to the CSP for development of the Continental Cablevision site would be as follows:

Tower	$98,000
Antennas (for existing tower users)	29,000
Cut over costs	5,000
Site preparation	56,000
Improved access	27,000
Remove existing tower	9,800
Annual tower/site maintenance	5,000
Sub-Total	$229,800

This estimated additional cost does not include the cost to acquire the additional land that would be needed to develop the site or bonding costs. The total cost of a CSP facility at the Continental Cablevision site would be approximately $1,170,000. (CSP1, Tab 13P, p. 1; CSP5, Q. 11; CSP9)

Proposed Tolland Site

41. The proposed CSP Tolland 90-foot by 90-foot facility site is located within a 20-acre parcel formerly managed by the DEP as part of the Nye-Holman State Forest. The land was transferred to CSP management pursuant to the Connecticut Special Act 89-54 and will be home to the new Troop C barracks. The elevation of the site is 660 feet AMSL. (CSP1, Tab 13D, p. 3; CSP1, Tab 14 Tolland, p. 10; CSP5, Q. 15)

42. Access to the proposed CSP Tolland facility would be over driveways at the Troop C barracks. (CSP5, Q. 2)

43. An 18-foot by 28-foot single story equipment shelter would house the telecommunications equipment at the proposed CSP Tolland site. Buried utilities would be brought to the shelter. The shelter would have full environmental controls, including air conditioning. The shelter would also house a 33-KW generator to power the equipment in the event of an electrical power failure. A 1000-gallon liquid propane tank would be buried on site to supply the generator with three days worth of fuel. The CSP would remotely test the generator for approximately ten to 15 minutes per week. Batteries housed in the shelter would provide back-up to the generator. On-site alarms would alert CSP personnel at the barracks to conditions in the shelter, including a breach of the building, high temperature, smoke, and propane leaks. (CSP1, Tab 12, pp. 2-6; CSP1, Tab 13D, p. 3)

44. Radio equipment operation at the proposed CSP Tolland facility would be remotely monitored. In the event of main-unit radio equipment failure, hot-standby equipment would be automatically switched on. (CSP1, Tab 12, p. 9)

45. The tower proposed for the CSP Tolland facility would be a 120-foot AGL, self-supporting, three-legged lattice tower approximately 20.75 feet at the base, tapering to eight and one-half feet at the top. In accordance with the Electronic Industries Association Structural Standards for Steel Antenna Towers and Antenna Supporting Structures EIA-222-E, the tower would be designed to maintain its integrity at 90 miles per hour with one-half inch of radial ice. (CSP1, Tab 13E, p. 2)

46. The CSP has planned to place six of their own antennas on the proposed Tolland tower at heights ranging from 60 feet AGL to 120 feet AGL. There have been no other requests to share the proposed tower. The tower would not have to be lighted or marked. (CSP1, Tab 13F, p. 5; CSP1, Tab 15, p. 3; CSP5, Q. 8)

47. The proposed CSP Tolland facility has been designed to provide a microwave link between Troop C and a CSP facility in Storrs, Connecticut. The Tolland facility would not provide 800 MHz radio transmissions. (CSP1, Tab 13C, p. 2; CSP5, Q. 3)

48. A monopole tower as an alternative to the proposed CSP Tolland 120-foot AGL self-supporting lattice tower would have an eight-foot diameter base tapering to a three-foot diameter top. The CSP rejected a monopole alternative because of increased costs associated with monopoles and the difficulty associated with adding additional antennas to the tower if the need arose. (CSP1, Tab 12, p. 7; Tr. Evening, p. 129)

Environmental

49. The site of the proposed CSP Tolland facility is currently forested, but will be cleared in conjunction with development of the Troop C barracks. (CSP1, Tab 14 Tolland, pp. 5-6)

50. Groundwater at the proposed CSP Tolland facility site is classified GA and is presumed suitable for direct public consumption. There are no wetlands or watercourses at the site. (CSP1, Tab 14 Tolland, pp. 5-6)

51. Existing tree heights in the area of the proposed CSP Tolland facility site range from 75 feet to 85 feet AGL. Trees on the facility site will be removed in conjunction with Troop C construction. With the removal of these trees, the tower would be partially visible from portions of Interstate 84 and from nearby residences. The CSP may have some leeway to move the proposed tower in order to

further distance the tower from nearby residences. The nearest residence is located approximately 1000 feet from the site. (CSP1, Tab 14 Tolland, pp. 7, 12-13; CSP5, Q. 6; Tr. Afternoon, p. 81)

52. There are no known extant populations of federal or Connecticut endangered and threatened species or species of special concern to Connecticut at the proposed CSP Tolland facility site. (CSP1, Tab 13 Tolland, Ex. E)

53. The proposed CSP Tolland facility would not generate solid waste or toxic substances. Air emissions from the operation of the emergency generator would not have a significant effect on air quality in the region. The noise of the emergency generator and the operation of the equipment shelter environmental controls would only affect ambient noise levels in the immediate area of the site. (CSP1, Tab 14 Tolland, pp. 3-4, 7-9)

54. The proposed CSP Tolland facility would have no effect on historic, architectural, or archeological resources. (CSP1, Tab 14 Tolland, Ex. E)

55. The total maximum radio-frequency power density level for the proposed CSP Tolland facility would be approximately 1.544 percent of the maximum exposure limit as established by ANSI in 1982 and adopted by the State of Connecticut pursuant to CGS section 22a-162. (CSP1, Tab 13O, p. 5)

56. The total maximum radio-frequency power density level for the proposed CSP Tolland facility would be approximately 7.184 percent of the 1991 revision of the ANSI 1982 guidelines for maximum exposure. (CSP6, Q. 22)

Schedule and Costs

57. Construction of the proposed CSP Tolland facility would occur after construction of Troop C is complete. Construction of Troop C is scheduled to begin in June of 1993 and is planned to be finished by the second quarter of fiscal year 1993-1994. (CSP1, Tab 13Q, p. 3; CSP1, Tab 14 Tolland, p. 10; CSP5, Q. 18)

58. The estimated total CSP cost of the proposed Tolland facility is as follows:

Radio equipment	$708,600
Tower	86,500
Antennas	15,600
Power systems	26,500
Site preparation, road, shelter	113,800
Miscellaneous	38,400
Total	$989,400

(CSP1, Tab 13P, p. 2; CSP5, Q. 11)

Alternatives

59. The CSP did not consider any alternative sites for its Tolland facility. (CSP1, Tab 15, p. 3)