DOCKET NO. 54A - Request for amendment to the Certificate of Environmental Compatibility and Public Need issued by the Connecticut Siting Council in Docket No. 54 to O'Brien Energy Systems, Inc.	:	Connecticut Siting Council
	:	February 5, 1988

FINDINGS OF FACT

1. O'Brien Energy Systems (O'Brien) in accordance with provisions of Section 16-50k and 16-50l of the Connecticut General Statutes (CGS), applied to the Connecticut Siting Council (Council) on October 24, 1985, for a certificate of environmental compatibility and public need (Certificate) to construct a 50 MW cogeneration facility to be located at the Hartford Steam Company (HSC), 60 Columbus Boulevard, Hartford, Connecticut. The project is known as the Hartford Steam Company Cogeneration Project (Project). (Record Docket 54)
2. On February 19, 1986, the Council issued a Certificate to O'Brien for the construction, operation, and maintenance of the Project. (Record Docket 54; O'Brien-1, p. 2)
3. O'Brien, in accordance with the provisions of Section 16-50l(d) of the CGS, applied to the Council on November 6, 1987, for an amendment of the Certificate for the construction of the cogeneration project. (Record, O'Brien-1, p.2)
4. The applicant, O'Brien Energy Systems, Inc., is a Delaware Corporation, with its principal offices at Green and Washington Streets, Downingtown, Pa. (O'Brien-1, p.1)

5. The fee as prescribed by Section 16-50v-1a of the Regulations of State Agencies (RSA) accompanied the amendment application. (Record)

6. The amendment application and notice thereof were served in accordance with CGS Section 16-501(b), of Chapter 277a and Section 501-1(e) of the RSA, to all specified persons. (Record; O'Brien-1, p.3; Exhibit 2)

7. Notice of the amendment application was given to the general public by publication in the Hartford Courant on November 4, 1987, and November 5, 1987, as specified in Section 16-501(b) of the CGS and Sec. 16-501(e) of the RSA. (O'Brien-1, p-3; Exhibit 2).

8. The Council and its staff made an inspection of the proposed Project site on January 6, 1986. (Record, Docket 54)

9. Pursuant to Section 16-50m of the CGS, the Council, after giving due notice thereof, held a public hearing on this amendment application in the Hartford City Hall, Hartford, Connecticut, beginning at 6:30 p.m. on December 16, 1987. (Record).

10. O'Brien is proposing to amend the Findings of Fact and the Decision and Order as originally approved by the Council in the Docket 54 proceeding with the following changes:

    1. Extending the term of the Certificate from June 30, 1989, to December 1, 1991;

    2. Replacing the two approved 63.5-foot emission stacks by a single approximately 195-foot emission stack; and

3. Constructing boiler ducts running horizontally to the stack approximately 10 feet above the roofline of the building, and approximately 52 feet above grade. (O'Brien-1, pps. 3-4)

11. The final height of the approximately 195-foot high emission stack would be based on Department of Environmental Protection (DEP) and Environmental Protection Agency (EPA) air compliance permit specifications. (O'Brien-1, pps. 5-6; Exh. 8)

12. Other than the proposed stack and boiler ducts, no additional equipment would be required. No structural modifications would be necessary to accomodate the proposed boiler ducts on the roof of the building. (O'Brien-2, Q-6, Tr. p. 16)

13. The capacity of the heat recovery boilers would be increased by enlarging the units by an additional six feet in length, nine feet in width, and ten feet in height. (O'Brien-2, Q-6, Tr. p. 16)

14. O'Brien estimates that construction would take approximately 17 months after all permits and approvals have been obtained. The expected in-service date would be approximately May 15, 1990. (O'Brien-1, p.5)

15. The electricity purchase agreement was approved by a DPUC decision on March 24, 1987. The air quality permit from the DEP is pending. (O'Brien-1, p.4)

16. The electricity purchase agreement contains an estimated Project in-service date of December 1, 1989. CL&P could terminate the agreement if the in-service date is not achieved by December 1, 1991. (O'Brien-1, p. 4)

17. Due to the effects of recent state and federal air pollution control requirements, coupled with an increased need for steam production, the two 63.5-foot emission stacks would be insufficient to obtain an air quality permit. (O'Brien-1, p.5)

18. Environmental air quality modeling indicated that the initially proposed 63.5-foot high stacks were inadequate for the original cogeneration plant steam capacity to comply with recently adopted hazardous air pollution standards for maximum stack concentrations of sulfuric acid. Even without an increase in steam capacity, an increase in stack height would have been necessary. (O'Brien-1, Exh. 4; O'Brien-2, Q-8)

19. The Findings of Fact and Decision and Order in Docket No. 54 recognized that DEP air compliance decisions would determine the final stack height. (Record Docket 54, Finding 35)

20. Water from the Metropolitan District Commission (MDC) for boiler use in the revised project would increase more than the approved project by an average 48,160 gallons per day or 34 gallons per minute (GPM). There would be no change in water use for the cooling system. (O'Brien-2, Q-15; Tr. p. 34)

21. The existing water usage at the HSC plant for the boiler makeup water, winter season, is as follows:

Average Use	320,930 gallons per day or 222 gallons per minute;
Peak Use	600 gallons per minute.

The estimated water usage, winter season, proposed revised Project, at full operating capacity is as follows:

Average Use	540,000 gallons per day or 375 gallons per minute;
Peak Use	1,010 gallons per minute.

(O'Brien-6)

22. The Metropolitan District would be able to supply the water demand of 1010 gallons per minute at peak load for the proposed addition to the Hartford Steam Company. (O'Brien; Exh. 6)

23. The Hartford Steam Company received approval of a discharge permit from the DEP for the discharge of cooling water into the Park River. The limits cited in this permit would be sufficient to accommodate the Project. (O'Brien-2, Q-17)

24. Due to recent construction in the Hartford area, the plume from the emission stack would be subjected to aerodynamic downwash. A downwash cavity would inhibit a smaller stack from dispersing facility emissions in an adequate manner. Other proposed building construction would influence dispersion and could consume more of the available air quality margin. (O'Brien-1, Exh. 4, O'Brien-2, Q-9)

25. The Standish Office Building on Columbus Avenue, south of the project site, would be the major receptor of aerodynamic downwash from emissions produced by the facility. Buildings located from the northeast and the northwest of the facility and from the southeast to the southwest of the facility would be affected. The actual downwash for each receptor was modeled only if violations of the National Ambient Air Quality Standards (NAAQS) would occur when using the Standish Building dimensions. (O'Brien-2, Q-11)

26. Only the Standish building and the Connecticut Natural Gas office building would affect pollutant dispersion from the proposed stack. The stack would be outside the radius of influence of Hartford's tallest buildings as defined by stack height regulations and DEP guidelines. (O'Brien-2, Q-12).

27. The approximately 195-foot stack height was based on pollutant emission and air impact restraints for several state and federal air programs, and on a worst-case situation involving short-term emissions from fuel oil combustion. These programs or analyses are as follows:

    a. Building-Induced Cavity Analysis;

    b. DEP Air Toxic Program;

    c. Prevention of Significant Deterioration (PSD) Analysis.

    The approximately 195-foot stack height was selected to ensure compliance with all programs and NAAQS. (O'Brien-2, Q-9)

28. A Building-Induced Cavity Analysis indicated the Sulphur Dioxide (SO2) 24-hr. impacts in the cavity-zone (area surrounding the facility) would be 1117 micrograms per cubic meter (ug/m3) or approximately three times greater than the 24-hr. NAAQS allowed for the approved facility. Therefore, the effective stack height (stack height plus momentum plume rise) would need to be above the cavity zone in order to comply with the NAAQS for SO2 attained. (O'Brien-2, Q-9)

29. The DEP Air Toxic Program required that sulfuric acid emissions from the proposed stack be evaluated to ensure that actual stack concentrations were less than the calculated maximum allowable stack concentrations (MASC). A stack height measuring approximately 186-187 feet would be required to keep sulfuric acid emission concentrations below the MASC. The approximately 195-foot height would provide a margin for design changes. (O'Brien-2, Q-9; Tr. p.14)

30. The Project was subject to a Prevention of Significant Deterioration (PSD) Evaluation for adhearence to PSD increments of SO2 and particulate matter. Modeling for the proposed facility and all adjacent PSD sources indicated that 24-hour SO2 impacts were predicted at 89 ug/m3, only 2 ug/m3 less than the allowable limit of 91 ug/m3. Any reduction in stack height would increase downwash effects and violate PSD incremental standards. (O'Brien-2, Q-9)

31. The Air Compliance Unit of the DEP has completed an evaluation of the proposed modifications. DEP determined that such construction and operation would not violate any NAAQS or any applicable emission limitation under the Connecticut State Implementation Plan for Air Quality. DEP proposes to grant a permit to construct two gas turbine engines with duct burners at the Facility. The pending permit would include the proposed approximately 195-foot stack. (O'Brien-2, Q-10; Tr. p. 24).

32. The DEP analysis of the O'Brien Cogeneration application determined that no Class I area would be impacted by the Project; PSD increments for SO2 would be protected; and Best Available Control Technology (BACT) would be applied to control sulfuroxides, nitrogen oxides, sulphuric acid, and other emissions. (O'Brien-2, G-10)

33. The DEP's analysis indicated that the Hartford area is designated nonattainment for the standard for particulate matter and the primary standards for ozone and carbon monoxide. A preliminary determination concluded that these sources would emit less than 100 tons/year of volatile organic compounds and the nonattainment provisions of Section 22a-174-3(1) would not apply to these sources (gas turbine boilers). More than 100 tons/year of carbon monoxide and particulate matter would be emitted by the operation of these sources (boilers). These impacts are determined as insignificant as defined by Section 22a-174-3(c)(7) therefore the nonattainment provisions do not apply. (O'Brien-2, Q-10)

34. A comparison of estimated emissions indicates that the higher steam loads would produce emissions for NOx, SO2, and TSP lower than current levels. No significant degradation of air quality is expected. (O'Brien-1, Exh. 4)

35. The Project with the proposed changes would be required by DEP to meet all applicable air quality standards. (O'Brien-1, p. 7)

36. The proposed approximately 195-foot stack would be the lowest height acceptable to the DEP for proper emission dispersion. The placement of the proposed stack would be limited to the proposed site since no other area is available. (O'Brien-2, Q-7).

37. The stack would be free standing, steel, and painted either in alternating red, white, and navy blue bands, or red and white to comply with Federal Aeronautics Administration (FAA) regulations. Lights would be installed on top of the stack, but no strobe light would be required. A FAA Permit Application is being prepared. (O'Brien-2, Q-14, Tr. pps. 39, 43-44)

38. The base of the proposed stack would be 75 feet from Interstate 91 and 550 feet from the Whitehead Highway. (O'Brien-2, Q-1)

39. The approved HSC Project was designed to produce a maximum of 485,000 lb/hr. of steam at peak load using two combustion turbines, two waste heat recovery boilers, and the existing Boiler No. 5. O'Brien proposes to increase the steam capacity of the facility by increasing the

capacity of the waste heat recovery boilers. The combustion turbines and the electric generating capacity of the Project would not be affected by this change. (O'Brien, Exh. 4)

40. The total connected steam heating demand of HSC's downtown customers currently exceeds 310,000 pounds per hour (pph). HSC is negotiating with new projects planned for construction over the next several years and expects to provide heating and cooling service to most of them. The forecast in steam demand requirements is as follows:

Year	Demand Growth (pph)	Total Requirements (pph)
1988	20,000	330,000
1989	25,000	355,000
1990	50,000	405,000
1991	50,000	455,000
1992	50,000	505,000

(O'Brien, Q-4)

41. New planned buildings that could be served by the HSC, would include the World Trade Center, City Place II, Goodwin Square, and the Cutter Building. (O'Brien-2, Q-4; Tr. p. 18)

42. The proposed Project would use low sulfur, 0.3%, No. 2 fuel oil during periods of interruption of natural gas supply to minimize air impacts. The existing plant now uses 1% sulfur No. 6 fuel oil. Emissions of Nox, SO2, and TSP would be expected to be lower than existing emissions. (O'Brien-2, Q-8)

43. The Project would operate 90% of the time on natural gas and 10% of the time on No. 2 fuel oil when natural gas is unavailable. The operation of the Project would result in an improvement in air quality when compared to the use of the existing HSC plant. (O'Brien, Exh. 4)

44. Natural gas usage, in millions of cubic feet per year (mmscf/yr), would increase from 837 at present to 3322 for the O'Brien facility with the proposed modifications. No. 2 fuel oil usage, in millions of gallons per year (mmgal/yr), would increase from 2.4 using maximum sulfur content of 1.0%, to 2.66, using maximum sulfur content of 0.3% The allowable limit for natural gas use would increase from the existing 4261 (mmscf/yr) to 8171 (mmscf/yr). (O'Brien-2, Q-5)

45. The single stack has been designed to minimize its visual impact on the surrounding environment. It would not be seen from Interstate 84 from the west of Hartford. From Interstate 91 in a northerly or southerly direction of travel, an estimated 20-30 feet of the stack would be visible. The stack would be visible when traveling west on I-84 in East Hartford. It would be visible when descending the ramp part of the Whitehead Highway and would be seen when traveling on Commerce Street. It would be seen from the Wilbur Cross Highway south of Hartford and from Governor Street. It would be seen from office buildings to the south. (O'Brien-1, pps. 5-6; Exh. 6; Tr. pps. 40-42)

46. The Court of Common Council of the City of Hartford submitted a resolution containing comments and concerns pertaining to the potential visual impact and integration of the approximately 195-foot stack on the cityscape of Hartford. (Record)

47. An alternative to the Project would be the development of individual heating systems in new buildings in Hartford. This alternative could result in less efficient operations, increased emissions, multiple stacks, and economic disencentive to Hartford development. (O'Brien-2, Q-8)

48. In order to reduce the stack to a lower height, a commercially unobtainable fuel with a sulfur level of less than one-tenth of 1% would be needed. (Tr. p. 14)

49. Delays in the in-service date have affected the total cost of the Project due to inflation. Delays may affect the financing costs which remain undetermined at this time. Financing of the Project has not been completed. A letter of intent for financing is expected early in 1988. (O'Brien-2, Q-3; Tr. 21)

50. The cost of the proposed smokestack and all new equipment is estimated at $520,000. The current total cost of the cogeneration equipment and building modifications, including the proposed stack is estimated at $40,953,000. (O'Brien-2, Q-2)

51. A comparison of boiler costs for the approved plant in Docket 54 with the revised costs including the proposed changes are as follows:

Original Costs	$ 2,082,000;
Revised Costs	$ 3,236,000;
Difference	$ 1,154,000.

(O'Brien-4)

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