

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

**NORTHEAST UTILITIES SERVICE  
COMPANY APPLICATION TO THE  
CONNECTICUT SITING COUNCIL  
FOR A CERTIFICATE OF  
ENVIRONMENTAL COMPATIBILITY  
AND PUBLIC NEED (“CERTIFICATE”)  
FOR THE CONSTRUCTION OF A  
NEW 345-KV ELECTRIC TRANSMISSION  
LINE FACILITY AND ASSOCIATED  
FACILITIES BETWEEN SCOVILL  
ROCK SWITCHING STATION IN  
MIDDLETOWN AND NORWALK  
SUBSTATION IN NORWALK, INCLUDING  
THE RECONSTRUCTION OF PORTIONS  
OF EXISTING 115-KV AND 345-KV  
ELECTRIC TRANSMISSION LINES,  
THE CONSTRUCTION OF BESECK  
SWITCHING STATION IN  
WALLINGFORD, EAST DEVON  
SUBSTATION IN MILFORD, AND  
SINGER SUBSTATION IN BRIDGEPORT,  
MODIFICATIONS AT SCOVILL ROCK  
SWITCHING STATION AND NORWALK  
SUBSTATION, AND THE  
RECONFIGURATION OF CERTAIN  
INTERCONNECTIONS**

**DOCKET NO. 272**

**OCTOBER 29, 2004**

THE TOWNS OF CHESHIRE, MILFORD, ORANGE, WESTON, WILTON, AND WOODBRIDGE

FIRST SET OF INTERROGATORIES TO ABB, INC.

The above-captioned towns (collectively, the “Towns”) <sup>1</sup>, each a party in the above-captioned proceeding, hereby request that ABB, INC. (“ABB”) answer the following interrogatories. The interrogatories are addressed to ABB. The

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<sup>1</sup> The undersigned represents solely the Town of Orange in this proceeding. The undersigned has been authorized to proffer the instant interrogatories on behalf of the Towns.

Towns request that ABB provide responses to the interrogatories on or before November 15, 2004.

If there are objections to any of the interrogatories, or if providing responses to particular interrogatories (or portions thereof) would be unduly burdensome, the Towns request that ABB contact the undersigned as soon as possible.

In the event that any interrogatory requests specific data or information that has already been provided in this proceeding, then ABB need only specifically identify where the responsive data or information is located in the record.

**I. DEFINITIONS**

A. As used in these Interrogatories, "any" shall include "all," and "all" shall include "any," as needed to make the request inclusive and not exclusive.

B. As used in these Interrogatories, "and" shall include "or," and "or" shall include "and," as needed to make the request inclusive and not exclusive. For example, both "and" and "or" mean "and/or."

C. As used in these Interrogatories, "include" and "including" mean "including but not limited to."

D. As used in these Interrogatories, "CL&P" means The Connecticut Light & Power Company and its present or former subsidiaries, affiliates, branches, divisions, principals, associated persons, control persons, directors, officers, employees, agents, trustees and beneficiaries. Each reference to CL&P shall be deemed to include any, all, or any grouping or sub-grouping of persons and entities named in the foregoing enumeration as needed to make the reference inclusive and not exclusive.

E. As used in these Interrogatories, "UI" means The United Illuminating Company and its present or former subsidiaries, affiliates, branches, divisions, principals, associated persons, control persons, directors, officers, employees, agents, trustees and beneficiaries. Each reference to UI shall be deemed to include any, all, or any grouping or sub-grouping of persons and

entities named in the foregoing enumeration as needed to make the reference inclusive and not exclusive.

F. As used in these Interrogatories, the “Applicant” means CL&P and UI collectively.

G. As used in these Interrogatories, ABB, INC and its present or former subsidiaries, affiliates, branches, divisions, principals, associated persons, control persons, directors, officers, employees, agents, trustees and beneficiaries. Each reference to ABB shall be deemed to include any, all, or any grouping or sub-grouping of persons and entities named in the foregoing enumeration as needed to make the reference inclusive and not exclusive.

H. As used herein “IRR” means the Interim Report of the Reliability and Operability Committee dated October 8, 2004.

### **FIRST SET OF TOWN INTERROGATORIES TO ABB**

1. Has ABB reviewed the IRR?
2. Is ABB aware of any HVDC systems imbedded into an integrated alternating current system?
3. If the answer to Interrogatory #2 is in the affirmative with respect to each such system in which an HVDC system is imbedded in an integrated A/C system provide the following information:
  - a. the location of the system;
  - b. how long the system has been in operation;
  - c. the respective lengths of each HVDC cable and A/C cable within the system;
  - d. the lengths of overhead and underground cable for both HVDC and A/C lines;
  - e. peak and average system loading.
4. Does ABB agree or disagree with the statement in the IRR that the ABB report does not realistically address identified criteria?
5. Please explain ABB’s agreement or disagreement as set forth in Interrogatory #4.
6. Does ABB agree or disagree that the conclusions reached in the ABB reports are based upon theory rather than operating experience as set forth in the IRR?
7. Please explain the response to Interrogatory #6.

8. If ABB agrees that there is a lack of operating experience with respect to the conclusions reached in the ABB report as set forth in the IRR, does ABB believe this to be a matter of concern with respect to the ability of VSC-HVDC line to meet the systems need in Southwest Connecticut on a reliable basis.
9. Please explain your response to Interrogatory #8.
10. Does ABB concur with the statement in the IRR that there is no significant or comparable experience with a VSC-HVDC project of the magnitude and complexity and scope of that proposed in the ABB report, which addresses even a fraction of the many aspects of system need that must be resolved in Southwest Connecticut?
11. Please explain the answer to Interrogatory #10.
12. If the answer to Interrogatory #10 is in the negative, please identify the following:
  - a. Each system containing significant or comparable experiences as that proposed;
  - b. With respect to each system identified in Interrogatory 12a those aspects of system need which are similar to those involved in Southwest Connecticut;
  - c. With respect to each system identified in Interrogatory 12a those aspects of system need in Southwest Connecticut which are not similar to the identified system.
13. Does ABB agree with the statement contained in the IRR that the use of VSC-HVDC in Southwest Connecticut will require an unprecedented number of converter stations in one portion of the system?
14. Please explain your answer to Interrogatory #13.
15. Please identify systems which have a similar number of converter stations to those that would be required in Southwest Connecticut.
16. Does ABB concur with the statement in the IRR that the use of each VSC-HVDC in Southwest Connecticut would require converter stations of the size not yet used anywhere?
17. Please identify any systems using converter stations of the size, which would be necessary for use in Southwest Connecticut for an imbedded VSC-HVDC line.

18. Does ABB agree with or disagree with the statement contained in the IRR that the use of VSC-HVDC in Southwest Connecticut would require the use of control technologies that are still in their infancy?
19. Please explain your answer to Interrogatory #18.
20. Please describe the control technologies that would need to be employed for the use of a VSC-HVDC system in Southwest Connecticut.
21. Please identify each system in which the control technologies identified in Interrogatory #20 have been utilized.
22. With respect to each system identified in Interrogatory #21, please describe the following:
  - a. line voltage
  - b. system load both peak and average
  - c. a comparison between the transmission infrastructure and capacity with that of the Southwest Connecticut system.
23. Does ABB agree or disagree with the statement contained in the IRR that the operating procedures necessary to operate an imbedded VSC-HVDC system in Southwest Connecticut would be impractical?
24. Please explain your answer to Interrogatory #23.
25. Please describe in narrative form the operating procedures that would need to be employed to address system changes for which an HVDC system would not be capable of responding to with the same facility as an A/C system.
26. Does the ABB-HVDC proposal demonstrate at least 1200-megawatt net increase in "all lines in" Southwest Connecticut import capability?
27. Will placing large series reactors in the generator leads for Bridgeport Energy and Bridgeport Harbor 3 diminish area reactors reserve necessary for voltage control?
28. Please explain your answer to Interrogatory #27.
29. Will the placing of large series reactors in the generator leads for Bridgeport Energy and Bridgeport Harbor 3 diminish transient stability performance?
30. Please explain your answer to Interrogatory #29.

31. Will the placing of large series reactors in the generator leads for Bridgeport Energy and Bridgeport Harbor 3 increase the potential of the transient over voltages?
32. Please explain your answer to Interrogatory #31.
33. If your answers to Interrogatories #27, #29 or #31 are in the affirmative, can those matters be addressed so as not to negatively impact the reliability and operability of the system in southwest Connecticut.
34. Please explain your answer to Interrogatory #33.
35. Will the use of an imbedded HVDC system in southwest Connecticut create unacceptable generation interdependencies?
36. Please explain your answer to Interrogatory #35.
37. Please explain how new generators could connect to the system without the installation of a converter system to meet future needs in Southwest Connecticut.
38. Do you agree with the statement in the IRR that the configuration necessary to connect new load substations in an HVDC system would be more expensive and complex than a connection to an all A/C system?
39. Please explain your answer to Interrogatory #38.
40. Do you agree with the statement contained in the IRR that HVDC station additions would create further operational coordination issues?
41. Please explain your answer to Interrogatory #36.
42. Do you agree with the statement in the IRR that an unreasonable number of significant and immediate changes would need to be made by system operators to the settings of each of the HVDC terminals in order to have a reliable and secure dispatch with varying dispatches and line outages?
43. Please explain your answer to Interrogatory #42.
44. Do you agree with the statement contained in the IRR that the use of an HVDC system would place an unacceptable burden on system operators to make changes in settings to have reliable and secure dispatch?
45. Please explain your answer to Interrogatory #44.

46. Do you agree with the statement contained in the IRR that HVDC over 330 megawatts is unproven?
47. Please explain your answer to Interrogatory #46.
48. Do you agree with the statement in the IRR that multi-terminal VSC-HVDC operation is unproven?
49. Please explain your response to Interrogatory #48.
50. If your answer to Interrogatory #46 and/or #48 is in the affirmative, does this mean that the proposed SC-HVDC could not be operated reliably?
51. Please explain your response to Interrogatory #50.
52. Do you agree with the statement contained in the IRR that a “typical” disturbance the concurrent mis-operation of an imbedded HVDC facility that is providing critical parallel path capability in Southwest Connecticut could readily result in a complete failure in the Southwest Connecticut System?
53. Please explain your answer to Interrogatory #52.
54. Would the mis-operation identified in Interrogatory #52 be reasonably likely to occur or improbable?
55. Please explain your answer to Interrogatory #54.
56. If your answer to Interrogatory #52 in the affirmative, can the HVDC system be designed and or to avoid the result referenced in Interrogatory #52?
57. Do you agree with the statement contained in the IRR that increased employment of VSC-HVDC converter terminals increases the likelihood of mistuning over the range of operating and maintenance conditions resulting in unanticipated sub-synchronous intervention with generators?
58. Please explain your answer to Interrogatory #57.

Respectfully submitted,

THE TOWNS OF CHESHIRE,  
MILFORD, ORANGE, WESTON,  
WILTON, AND WOODBRIDGE

BY \_\_\_\_\_  
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Their Attorneys

**Certification**

I hereby certify that a copy of the foregoing has been mailed, e-mailed and/or hand-delivered to all known parties and intervenors of record this 1<sup>st</sup> day of November, 2004.

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Brian M. Stone



