**STATE OF CONNECTICUT**
**SITING COUNCIL**

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| Re: | The Connecticut Light and Power Company and The United Illuminating Company Application for a Certificate of Environmental Compatibility and Public Need for the Construction of a New 345-kV Electric Transmission Line and Associated Facilities Between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk, Connecticut Including the Reconstruction of Portions of Existing 115-kV and 345-kV Electric Transmission Lines, the Construction of the 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 272<br><br>March 28, 2005 |

**COMMENTS AND EXCEPTIONS OF THE CONNECTICUT LIGHT AND POWER COMPANY AND THE UNITED ILLUMINATING COMPANY REGARDING THE COUNCIL'S DRAFT FINDINGS OF FACT**

The Connecticut Light and Power Company ("CL&P") and The United Illuminating Company ("UI") ("the Companies") file these comments and exceptions to the draft findings of fact (the "Council's FOF") issued by the Connecticut Siting Council ("Council") on March 23, 2005 relating to the Middletown to Norwalk Project ("the Project").

## I. GENERAL COMMENT: RECOMMENDATION THAT THE COUNCIL MAKE DISCRETE FINDINGS ON EACH C.G.S. § 16-50p REQUIREMENT

**Findings Required Under § 16-50p(a)(3)**

Connecticut General Statutes ("C.G.S.") § 16-50p(a)(3) sets forth the findings required as a condition to the Council's issuance of a Certificate of Environmental Compatibility and Public Need ("Certificate") for electric transmission lines. Although the Council's draft findings include a review of each of the subjects of these statutorily required findings (e.g., need,

environmental impact, EMF), the Companies recommend that the Council add to its findings a section including specific findings that expressly track the statutory language. This will make it clear that the Council has reviewed and addressed each of these issues in its ruling in this docket.

C.G.S. § 16-50p(a)(3), as amended by P.A. 04-246, requires the Council to make several findings in order to issue a Certificate for an electric transmission line. These findings are set forth below, along with citations to the Companies' proposed Findings of Fact (the "Companies' FOF") supporting these findings:

- "[P]ublic need for the facility and the basis of the need" (§ 16-50p(a)(3)(A)) (see Companies' FOF ¶¶ 107-140);

- "[T]he nature of the probable environmental impact of the facility alone and cumulatively with other existing facilities, including a specification of every significant adverse effect, including, but not limited to, electromagnetic fields that, whether alone or cumulatively with other effects, on, and conflict with the policies of the state concerning, the natural environment, ecological balance, public health and safety, scenic, historic and recreational values, forests and parks, air and water purity and fish, aquaculture and wildlife" (§ 16-50p(a)(3)(B)) (see Companies' FOF ¶¶ 400-478, 480-551; 638-832; Appendix to Companies' FOF);

- "[W]hy the adverse effects or conflicts referred to in subparagraph (B) of this subdivision are not sufficient reason to deny the application" (§ 16-50p(a)(3)(C)) (see Companies' FOF ¶¶400-478; 480-551; 638-832; Appendix to Companies' FOF);

- "[W]hat part, if any, of the facility shall be located overhead" (§ 16-50p(a)(3)(D)(i)) (see Companies' FOF ¶¶57-58; 82-83; 86-88);

- "[T]hat the facility conforms to a long-range plan for expansion of the electric power grid of the electric systems serving the state and interconnected utility systems and will serve the interests of electric system economy and reliability" (§ 16-50p(a)(3)(D)(ii))(see Companies' FOF ¶¶ 92-106);

- "[T]hat the overhead portions, if any, of the facility are cost effective and the most appropriate alternative based on a life-cycle cost analysis of the facility and underground alternatives to such facility" (§ 16-50p(a)(3)(D)(iii)) (see Companies' FOF ¶¶ 141-160);

- "[T]hat the overhead portions, if any, of the facility ... are consistent with the purposes of this chapter, with such regulations or standards as the council may adopt pursuant to section 16-50t, including, but not limited to, the council's best management practices for electric and magnetic fields for electric transmission lines and with the Federal Power Commission 'Guidelines for the Protection of Natural Historic Scenic and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities' or any successor guidelines and any other applicable federal guidelines" (§ 16-50p(a)(3)(D)(iii)) (see Companies' FOF ¶¶ 205-233; 336-374; 400-478; 480-451; 638-832; Appendix to Companies' FOF);

- "[T]hat the overhead portions, if any, of the facility .... are to be contained within an area that provides a buffer zone that protects the public health and safety, as determined by the council. In establishing such buffer zone, the council shall take into consideration, among other things, residential areas, private or public schools, licensed child day care facilities, licensed youth camps or public playgrounds adjacent to the proposed route of the overhead portions and the level of the voltage of the overhead portions and any existing overhead transmission lines on the proposed route. At a minimum, the existing right-of-way shall serve as the buffer zone" (§ 16-50p(a)(3)(D)(iii)) (see Companies' FOF ¶¶ 205-233; 336-374; 400-478; 480-451; 638-832; Appendix to Companies' FOF);

- "[T]hat the location of the line will not pose an undue hazard to persons or property along the area traversed by the line" (§ 16-50p(a)(3)(E)) (see Companies' FOF ¶¶ 829-830).

The Companies recommend that the Council include discrete findings addressing each of the above statutory requirements.[1]

**The "Presumption"**

P.A. 04-246 created a rebuttable presumption that a proposal to create an overhead 345-kV line adjacent to "residential areas, private or public schools, licensed child day care facilities, licensed youth camps or public playgrounds, is inconsistent with the purposes of"

[1] The Council may of course also address some or all of these "ultimate" findings in its Opinion and Decision and Order. However, the Companies submit that it would still be beneficial to include explicit findings on each of these matters in its findings of fact.

PUESA (the "Presumption"). P.A. 04-246 provides that an applicant may rebut the Presumption by demonstrating "that it will be technologically infeasible to bury the facility." P.A. 04-246, §7; C.G.S. § 16-50p(i). Because the "Presumption" has played such a pivotal role in this docket, the findings on this issue are critical. The Companies therefore recommend that the Council:

- include a specific finding that the Companies have demonstrated that it is not technologically feasible to bury the proposed 345-kV line adjacent to each of the residential areas, private or public schools, licensed child day care facilities, licensed youth camps or public playgrounds adjacent to the overhead portions of the line;
- adopt and incorporate the Companies' FOF ¶¶ 632-637, as set forth below, which provide a concise summary of the key findings regarding the undergrounding issues addressed in this docket.

632. The Companies' proposed route, including 24 linear miles (48 circuit miles) of 345-kV underground cable between Norwalk and East Devon, and Alternative A, including 13 linear miles (26 circuit miles) of underground cable, are technologically feasible.

633. The potential for high TOVs increases with the amount of cable (capacitance) as the linear miles of underground cable increases from 24 linear miles (48 circuit miles).

634. Adding any incremental underground cable to the 24 miles proposed by the Company is not technologically feasible.

635. In order to maximize the amount of underground cable, the Companies have revised their original proposal to include:

- The use of XLPE cable.
- Replacement of surge arrestors.
- Use of 500kV equipment at substations.
- Procedures to operate only one HPFF cable in the Bethel to Norwalk line under most conditions.

636. Although computer modeling suggests that C-Type filters could be effective in mitigating TOVs and therefore could conceptually enable some additional undergrounding beyond the Companies' proposed 24 miles, C-Type filters have never been used to mitigate TOVs. The risk of using them in this application is not acceptable.

637. [High Voltage Direct Current] and [Gas Insulated Lines] are not feasible for the SWCT system.

## II. SECTION-BY-SECTION COMMENTS[2]

### Comments on ¶¶ 1-9
### "Introduction"

**Detailed Comments**

| Paragraph | Comments |
|---|---|
| 9 | A summary of the Agency comments received by the Council regarding the proposed facility would be appropriate. See Companies' FOF ¶¶ 39-43. |

### Comments on ¶¶ 12-53
### "Need for Expansion of the Electric Power Grid"

**General Comments**

- The findings should state that the need for the Project is not in dispute. See Companies' FOF ¶ 124. Additionally, more detailed information on the urgent need for the Project should be included in the findings. See Companies' FOF ¶¶ 107-140.

- The findings should provide more background and information on the existing electrical system and how the Project fits in with the overall plan for the area. See Companies' FOF ¶¶ 103 – 110.

[2] In this section of the Companies' Comments and Exceptions, suggested additional language to the Council's FOF is underlined, while suggested deletions are shown in brackets.

**Detailed Comments**

| Paragraph | Comments |
|---|---|
| 37 | "CL&P" should be "CL&P and UI" in the first sentence. |
| 38 | The Companies suggest that the Council's FOF be replaced with the following:<br><br>At the completion of the Bethel to Norwalk and Middletown to Norwalk projects, the 345 kV system will be able to inject power into the 115 kV system at Plumtree Substation in Bethel, Norwalk Substation in Norwalk, Singer Substation in Bridgeport, East Devon Substation in Milford, East Shore Substation in New Haven, Frost Bridge Substation in Watertown, and Southington Substation in Southington. After noting load growth at various points on the grid, CL&P and UI could make modifications to move the power from the 345-kV to the 115 kV substations to supply the load. The incremental 115-kV construction may include some reconductoring of lines. 3/23/04 Tr. at 41-43. |
| 52 | A more detailed explanation of the planning process requires an explanation of why 15 GW is appropriate most of the time. See Companies' FOF ¶¶ 502-508. |

**Comments on ¶¶ 54-83**
**"Reliability"**

**General Comments**

- The need for the Project is linked closely to violations of reliability standards. See Companies' FOF ¶¶ 123, 125 – 129. The Council's discussion of need should appropriately emphasize the violations of reliability standards that exist today, as a substantial factual basis for the Council's determination of need.

**Detailed Comments**

| Paragraph | Comments |
|---|---|
| 61 | This finding should list specific examples of the effects of the problems in SWCT on other areas, such as rolling blackouts and load shedding. See Companies' FOF ¶ 115. |
| 62 | This finding should cite the Glenbrook-Norwalk Project as an example of a specific project that will further reduce thermal overloads. See Companies' FOF ¶ 129. |
| 69 | This finding should state that transmission upgrades are necessary even if integrated solutions such as distributed generation and demand side management are employed. See Companies' FOF ¶ |

| Paragraph | Comments |
|---|---|
| | 112. In addition, this draft finding states that CL&P needs to build system infrastructure for system reliability to meet planning criteria; it should also mention UI. |
| 74 | The third sentence of this finding appears to be missing a word. It should read "approximately 1100 MW of *additional* generation is needed to reliably serve load." |

**Comments on ¶¶ 84-102**
**"System Alternatives"**

**General Comments**

- The Council's findings should discuss a "No Transmission" Alternative and how it would fail to address reliability problems. See Companies' FOF ¶¶ 161-164.

- The Council's findings should be supplemented with more detailed information on generation alternatives. See Companies' FOF ¶¶ 201 – 203.

**Comments on ¶¶ 103-172**
**"High Voltage Direct Current Technology Alternative"**

**General Comments**

Many of the Council's FOF in ¶¶ 103-172 reflect ABB's contentions, not a comprehensive set of findings with respect to the consideration of the use of high voltage direct current ("HVDC") for this Project.

The Council's findings regarding HVDC should include findings that:

- HVDC, whether conventional or voltage source converter ("VSC HVDC") is not technologically feasible for this Project. See Companies' Ex. 176 (Reliability and Operability Committee (ROC) Report dated December 20, 2004, pp. 9, 29-33); Companies' FOF ¶ 628.
- HVDC, whether conventional or VSC HVDC, does not meet the electric system criteria established for the Project. Id.
- There is no experience with embedding an HVDC system into an alternating current system, as would occur if the ABB proposal were followed. Id. at 29.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 103 | If this draft FOF is retained, the last sentence should be changed to read that "ABB developed three underground HVDC alternatives which ABB claims were technically feasible." |

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| 107 | Additional sentences should be added to this finding: "There are only five VSC HVDC projects in operation. Approximately 767 MW of VSC HVDC lines are in service, and nearly all have been in service for less than five years. More than half of the megawatts have been in operation for two years or less." 12/15/04 Tr. at 53, 59-60. |
| 108 | When "DC Light" is used, it should be clarified that this is the ABB trademark for VSC HVDC. 12/15/04 Tr. at 52 (Bahrman). |
| 110 | This finding should be clarified, to reflect the context of the transcript statement: "An HVDC system between Beseck and East Devon is technically feasible to construct if cost is not a consideration." |
| 115 | A second sentence should be added to this finding: "The losses associated with a VSC HVDC system would be substantially greater than the losses associated with an AC system." 7/29/04 Tr. at 96 (Walling) |
| 116 | The use of the word "aspects" is unclear. If VSC HVDC were utilized, the ability to expand the electric system would be impaired, including each of the specific problems identified in the finding. |
| 119 | The additional cost to a generator should be quantified. A 700 MW generator would incur in excess of $100 million to connect to a VSC HVDC system rather than an AC system, based upon the converter cost included in FOF ¶ 118. 12/15/04 Tr. at 157. |
| 121 | A second sentence should be added: "AC lines would need to pick up the increased power flow in the event of a contingency." 12/15/04 Tr. at 176 (Bahrman). |
| 123 | This finding should begin with "ABB claims that". |
| 124 | This finding should begin with "ABB claims that".<br><br>A sentence should be added: "ISO-NE states that HVDC would add unacceptable operating complexity to the electric system; the consequences of a problem are significant; and the reliability risk to SWCT is too great." See ISO-NE's FOF ¶¶ 50, 54. |
| 129 | A second sentence should be added: "Adding additional converter stations also would substantially increase the cost." |
| 130 | This finding should begin with "ABB claims that".<br><br>A second sentence should be added: "ISO-NE states that there is no adequate assurance that system control scheme software programs, which would need to be used to implement security-constrained dispatch, can be designed, engineered and constructed with the ability to respond to outages on either the VSC HVDC or AC system in a timely manner and effect changes to the system such that it is secure for any possible subsequent event." ISO-NE's FOF ¶ 54. |

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| 133 | This finding should begin with "ABB claims that". |
| 142 | This finding should be deleted. The premise of the finding ("[i]f DC can operate between Beseck and East Devon") was determined not to be technologically feasible, nor to meet system need. |
| 151 | This should be combined with Council's FOF ¶106. |

**Comments on ¶¶ 173-194**
**"Project Description"**

**General Comments**

The Council's draft findings should include citation to updated exhibits and testimony, which modify the Project. Specifically, Council's FOF ¶¶ 183, 185 an 187 should reflect the change from HPFF to XLPE cable and the resulting changes to substation equipment. See Companies' Exhibits 188 and 201.

The Companies suggest moving Council's FOF ¶¶ 193 and 194 to the next section – "Alternatives A & B".

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 177 | Middlefield Alternate A Route should be ".7" not ".07" |
| 178 | 1380 refers to the current rating, not the MVA rating. The MVA rating is 1650. See Companies' Ex. Vol. 6, Evaluation of Potential 345-kV and 115-kV Cable Systems, p. 10. This is consistent with Appendix A, p. 3 of the ROC Report. The citations to Applicant 55, Q. 51, and Applicant 71, Q. 53 refer to Westport and should be eliminated. |
| 179 | First sentence should read "has an", not "has. An". Cite should read "Applicant 1, Vol. 1, P. I-23, H-44." |
| 181 | "Appliccant" should be "Applicant" |
| 183 | First Bullet: eliminate "two variable 345-kV shunt reactors". Eliminate "one 345-kV series reactor".<br>Eliminate the 4th bullet, 6th and 7th bullets. As discussed in Companies' FOF ¶¶ 91, this equipment was eliminated as part of the project modifications described in the Final ROC Report (Companies' Ex. 176).<br>Applicant 54, p. 6 is wrong reference. Add Applicant 201, p. 2; and Applicant ¶ FOF 91. |
| 184 | 4th bullet should read "1-1590 kcmil" not "2-1590 kcmil"<br>Applicant 54, pp. 5 and 6 is wrong reference. Suggest existing cites be eliminated and replaced with Applicant 201, pp. 2-3. |

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| 185 | 1st bullet should read "500 kV class breakers"<br>"Pequannock" should be spelled "Pequonnock" throughout.<br>2nd bullet (330'long x 50' wide x 40' high) should read (312' long x 75' wide x 40' high)<br>3rd bullet should read "Two 600 MVA 345/115-kV autotransformers consisting of one three phase unit each and the required insulating fluid spill containment measures"<br>4th bullet should read "Four 345-kV 50-100 MVAR variable shunt reactors with fluid containment."<br>6th bullet should be eliminated.<br>Cites should be Applicant 1, Vol 1, pp. I-26-I 27; Applicant 54, pp. 32-34; Applicant 201, p. 3; Applicant 188, pp. 3-4; Applicant FOF ¶¶ 90, 91. |
| 186 | 2nd bullet "Pequannock" should read "Pequonnock"<br>Applicant 54, pp. 32 to 34 is wrong reference. Suggest Applicant 201, p. 3 replace Applicant 54, pp 32-34. |
| 187 | 1st bullet: Substitute 500-kV class circuit breakers for 345-kV circuit breakers; substitute "50-100" for "75-150"<br>Eliminate 2nd bullet.<br>3rd bullet eliminate "six 345-kV single phase series reactors,"<br>Add cite to Applicant 201, p. 3. |
| 189 | Add ")" after 4020 |
| 190 | Replace "Pequannock" with "Pequonnock" |
| 193 | Last bullet replace "4" with "15". Add Companies' Exhibit 49, p. H33 to cites. |

**Comments on ¶¶ 195-203[3]**
**"Alternative A" and "Alternatives A & B"**

**General Comments**

The Council's FOF should include reference to the detailed studies performed for these routes, as detailed in the Application and in other exhibits. These findings of the Council should be revised to include more specific information about Alternatives A and B and also to identify the reasons why these options are not preferable to the proposed route. Further, Council's FOF ¶¶ 193 and 194, which are grouped under "Project Description," relate to Alternatives A and B and should be moved to this section. See Companies' FOF ¶¶ 336 – 354.

[3] It is the understanding of the Companies that at the March 23, 2005 Council meeting the staff was asked by Council members to discuss Alternative A and B separately in the revised draft of the Council's FOF.

The Council's findings should include clear descriptions of each alternative route, or references to the portions of the record that contain such information. The characteristics of each route should be concisely enumerated and the potential effects of installing the 345-kV line along each should be described. (See e.g., the Companies' FOF ¶¶ 346 – 347, 351, 352, 353) Each alternative should be discussed separately, and the findings should compare the two alternatives to the proposed route. (See e.g., for example, the Companies' FOF ¶¶ 336 – 338, 348 – 352, 354)

The Council's FOF ¶¶ 200 – 203 are grouped under "Alternatives A & B." However, these paragraphs pertain to overhead route evaluation criteria that the Companies applied to assess all overhead route options (not just Alternatives A & B), and structure design standards, etc. These findings should be included in discussion of these other options.

**Detailed Comments**

| Paragraph | Comment |
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| 195 | This FOF is labeled "Alternative A (Singer – Hawthorne)", but presents summary information not about the underground portion of Alternative A between Singer and Hawthorne, but the overhead portion between Hawthorne and Norwalk Substation. The purpose of this FOF is not clear. For a description of the route of Alternative A, refer to the Companies' FOF ¶¶ 339 to 345. |
| 195, 197 | These paragraphs relate to Alternative A and should be grouped accordingly.<br><br>Further, Alternative A would require the acquisition of about 62 acres of privately-owned land for additional easements along the expanded overhead ROW between Hawthorne Substation and Norwalk Substation (the width of which would have to be increased by about 45 feet) and an additional 2-4 acres for a transition station at Hawthorne. (See the Companies' FOF ¶¶ 341, 346) |
| 198 | This paragraph pertains to Alternative B and should be combined with more detailed information about the route alternative, as described in the General Comments above. For a description of the route of Alternative B, refer to the Companies' FOF ¶¶ 348 to 352. To accommodate the 345-kV line, Alternative A would involve additional easement acquisition from private landowners. (See the above response to the Council's FOF ¶ 197) |
| 199 | Alternatives A and B would result in 49 and 85 more wetland crossings than the proposed route. (See the Companies' FOF ¶¶ 346, 353) Further, Alternatives A (73 miles) and B (76 miles) would both be longer than the proposed route (69 miles). (See Companies' FOF ¶¶ 339, 346, 348, 353, 354) |
| 200 | This FOF identifies the factors that the Companies considered |

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| | when evaluating any potential overhead alignment options – not just Alternatives A and B. Such data would be more appropriately presented in conjunction with the description of route evaluation criteria provided in the Council's FOF ¶¶ 174. The Companies' FOF ¶¶ 205 – 212 described general and overhead transmission line routing objectives and criteria, while its FOF ¶¶ 213 – 221 describe additional criteria for the evaluation of underground transmission cable routes. |
| 201 - 203 | These FOF pertain to technology considerations that are factored into the assessment of overhead transmission structure height and configurations. These FOF do not reference the low magnetic field overhead designs that were considered, at the request of the Council, during the course of the Docket. The Companies' FOF ¶¶ 222 – 224, as well as the Appendix to the FOF, provide additional information regarding technology considerations in the evaluation of alternative overhead configurations and identifies the configurations that would be involved in low magnetic field designs. Further, the Companies' FOF ¶¶ 225 – 233 summarize facts concerning underground cable configuration considerations. |

**Comments on ¶¶ 204 – 208**
**"Project Description"**

**General Comments**

All of these paragraphs appear to be misplaced under the "Project Description" heading within the discussion of Alternatives A and B. They relate to a variety of miscellaneous topics, and do not appear to relate to Alternatives A & B. If determined to be necessary, they should be inserted after Council FOF ¶ 192.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 208 | To more accurately reflect the transcript, revise to read: "The proposed 345-kV system should last for 20 to 30 years before major investments are required to the 345-kV grid in SWCT." |

**Comments on ¶¶ 209-281**
**"Route Alternatives"**

**General Comments on Route Alternatives**

This section pertains to route alternatives that were evaluated and determined to be not feasible. Such route alternatives are distinct from Alternatives A and B, which are feasible, but are not preferred compared to the proposed route. Information regarding the Companies' alternative transmission route evaluation process can be found at the Companies' FOF ¶¶ 235 – 242. This section should be expanded, to include the additional comprehensive evaluations of the East Shore Route, Northerly Route, Black Pond, railroad alternatives, and highway alternatives that were performed at the request of the Council during the course of the hearings. Such evaluations demonstrate the assessment of a wide range of potential routing options for the Project. The Companies' FOF ¶ 242 identifies the specific transmission route alternatives that were considered in depth during the Council proceedings.

This section should also be expanded to include findings related to the alternatives analyses conducted for the locations of the proposed Beseck Switching Station, East Devon and Singer substations and for the modifications to the existing Scovill Rock Switching Station and Norwalk Substation. The findings for this topic should be included as a separate section under "alternatives'. The Companies FOF ¶¶ 377 to 399 summarize the data concerning the substation / switching station alternatives.

**Comments on ¶¶ 211 – 215**
**"Northerly Route and New Corridor Alternative"**

**General Comments**

The discussion of the Northerly Route should include additional citations to the Docket record, and should identify the reliability concerns regarding the alignment of four 345-kV lines on common ROWs, including the caution in the NPCC code against locating multiple 345-kV lines on the same ROW. The FOF should state that the Northerly Route would be longer, would require ROW expansion and additional vegetation clearing, and could require the acquisition of homes (depending on the configuration).

Specific information regarding the Northerly Route is detailed in the Companies FOF ¶¶ 297 – 306.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 211 | There is no record citation for this FOF. However, similar route descriptive data is contained in the Companies' FOF ¶¶ 297 – 298. |
| 212 | This description does not distinguish clearly between the facilities that would be required for the proposed route vs. the Northerly Route. Although the Northerly Route would follow the same alignment as the proposed route between Black Pond Junction and Beseck, three additional 345-kV lines would have to be added to the ROW, resulting in four 345-kV lines within a single corridor. In contrast, the proposed Project would only involve the addition of a single 345-kV line to the existing 387 Line that presently occupies the ROW between Black Pond Junction and Beseck. (See Companies' FOF ¶ 299) |
| 213 | The table presented in this discussion was originally presented as Companies' Exhibit 90, and was updated by Companies' Exhibit 90a. The revised Exhibit 90a table should be used because it provides supplemental comparative data concerning the additional ROW that would be required along each segment of the Northerly Route alternative vs. the proposed route. The Companies' FOF ¶¶ 303 – 304 summarize data concerning the Northerly Route configurations that were investigated. |
| 214-215 | This FOF is incorrectly numbered, with 215 added extraneously in middle of the paragraph for ¶ 214. |

**Comments on ¶¶ 216 – 231**
**"Railroad Route"**

**General Comments**

This section should identify each of the railroad corridors that were evaluated as potential route options for the Project. The findings should reference the extensive analyses (i.e., reports, visual presentations) that were performed to identify and evaluate railroad corridor alternatives. (See Companies' FOF ¶ 246)

In addition to the Metro-North / Amtrak railroad corridor between East Devon and Singer substations and then between Singer and Norwalk substations, the findings should discuss the Airline and Amtrak railroad corridors that were evaluated between New Haven and Wallingford. These railroad corridors were investigated and dismissed by the Companies during initial Project evaluations, but were re-assessed, at the request of the Council, as part of the East Shore Route review. (See Companies' FOF ¶¶ 246, 259 – 261, 320 - 327)

This section should include a finding that all of the rail corridors and ROWs are not a practical or feasible location for the 345-kV line.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 217-218, 221, 223-228, 230-231 | Based on the transcript references, these FOFs appear to relate to the Metro-North / Amtrak Railroad corridor between East Devon and Norwalk. These FOFs, along with ¶ 222 (see below), need to be grouped together under a heading that clearly identifies the railroad route alternative being discussed. |
| 222 | This FOF does not identify the location of the railroad corridor along which construction of an underground cable would require the removal of "one existing 115 kV line...".<br><br>This statement is taken from the Companies' presentation during testimony on April 21, 2004 regarding the railroad corridor between East Devon and Singer substations. Information presented regarding this railroad corridor is summarized in the Companies' FOF ¶¶ 249 – 258. |
| 219 | This FOF is grouped with the analysis of the Metro-North / Amtrak Railroad corridor. For clarity, the Airline Railroad analyses should be presented separately and should reference not just the testimony, but also the exhibits and visual presentations that were presented on this subject. (See Companies' FOF ¶¶ 259 – 261) |
| 229 | This FOF relates to the Route 15 alternative and should be moved to the section on highway corridor options. |

**Comments on ¶¶ 232 – 257**
**"Highway Corridor Option"**

**General Comments**

These findings on highway corridor alternatives (I-91, I-95, State Route 15) should reference the reports, visual presentations, and responses to data requests. (See Companies' FOF ¶¶ 262 – 288).

The findings should be expanded to discuss the Connecticut DOT policies regarding the construction of transmission lines within and parallel to the ROW of any controlled access highway, including I-91, I-95, U.S. Route 7, and State Route 15. (See Companies' FOF ¶ 263) The Findings should identify both the key construction feasibility criteria for using limited

access highways and the particular factors that led to the elimination of each of the highway corridor options from consideration. (See Companies' FOF ¶¶ 264 – 268)

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 233, 235 | Both of these FOF relate to the Merritt Parkway and should be grouped with under the "Route 15 Option" heading. FOF ¶ 235 is redundant and should be omitted. |
| 240 – 244, 250-256 | These paragraphs relate to Route 15 and should be grouped together. |
| 236 -239 | These paragraphs pertain to I-95 and I-91 and should be identified and grouped accordingly. As detailed in the Companies' FOF ¶¶ 269 – 273 (for I-91) and 274 – 277 (for I-95), neither of these limited access highway corridors would provide a viable alternative route for the 345-kV line due to factors such as environmental constraints, urban land uses, and serious construction issues. |
| 246 | It is not clear how this statement regarding an underground cable route between Millstone and East Devon relates to the consideration of highway corridor options. This statement would more appropriately be included in the FOF section pertaining to system or technology alternatives. |
| 247, 248 | This paragraph pertains to the use of HVDC between East Shore and East Devon. It should be more appropriately grouped with other information regarding HVDC (e.g., the Council's FOF ¶¶ 167 – 169). |
| 249 | This is a systems alternatives discussion item that should not be in the highway corridor options discussion section. |
| 257 | The paragraph pertains to the Administrative Notice that was taken, during the April 22, 2004 hearing, of Docket Nos. 197 and 208. It is not clear why this is necessary for inclusion in the FOF, particularly since these dockets (Cross Sound Cable) were noticed in relation to the marine route analysis and are not relevant to the Route 15 Option. |

**Comments on ¶¶ 258 – 266**
**"Marine Route Option"**

**General Comments**

The findings should include reference to the detailed route evaluation studies that the Companies commissioned to assess the feasibility of marine routes. (See Companies' Exhibit 4,

"Middletown-Norwalk 345-kV Submarine Transmission Line Routing Study"; Companies' Ex. 95a, "Middletown – Norwalk Project: New Haven Harbor to East Devon Marine Route Review").

The findings should refer to the Companies' initial reviews of the feasibility of a marine routing between Millstone and Norwalk. (See Companies' FOF ¶ 289 – 296).

Moreover, the findings should reference the correspondence to the Council from the Connecticut Department of Agriculture, Bureau of Aquaculture ("BOA") or the Connecticut Department of Environmental Protection ("DEP") regarding potential marine routes. Both agencies expressed substantial concerns about a marine route alternative.

The discussion of marine route alternatives would be clearer if distinctions were made between the route considered between Singer and Norwalk substations versus the route option evaluated as part of the East Shore Route, between East Shore Substation and East Devon.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 259 | The concerns identified in this paragraph regarding consistency with federal and state legislation apply equally to any marine route. See Companies' FOF ¶ 295. |
| 261, 262, 263, 264 | These paragraphs pertain to the Singer to Norwalk marine routing study and should be identified as such. Marine / upland route options between these two substations were identified and evaluated by ESS Group, Inc. (See Companies' FOF ¶¶ 289 – 296) In addition, FOF ¶ 263 needs to be corrected to state that a marine route would involve 15.4 miles of marine (not "marsh") installation and 7.6 miles of upland. (See Companies' FOF ¶ 291) |
| 260, 265 | These paragraphs pertain to the East Shore – East Devon marine option that was evaluated as part of the overall East Shore Route review, and should be grouped. (See Companies' FOF ¶¶ 292, 329, 330) |
| 266 | This paragraph is taken out of context and relies solely on a transcript reference, which consists of a response to a Council member's question about whether a marine route between Millstone and Norwalk was considered. It should either be deleted or expanded to clarify that marine routes are not feasible for this Project for a variety of environmental, regulatory, and construction / engineering reasons. Further, both the DEP and the BOA have serious concerns with respect to a marine route; these agencies' concerns should be identified in this Finding. |

**Comments on ¶¶ 267 – 281**
**"East Shore Option"**

**General Comments**

The findings relating to the East Shore Route should reference the reports, data responses, and presentations that were used in evaluating this route alternative.

The findings should also indicate that the "East Shore Route" encompasses a number of different sub-alternatives, each of which involves route options for the portion of the proposed route between Beseck and East Devon. A range of route options and overhead / underground configurations were evaluated, such as the use of the 387 Line ROW (first considered as a one-line 345-kV option and then evaluated for the location of a second 345-kV line), the Airline and Amtrak railroad corridors, routes within road ROWs, and marine / upland routes.

The findings should state the reasons why the various East Shore Route configurations are not viable for the Project, based on the criteria of operability / reliability, technical feasibility, environmental impact, and reasonable cost.

This section should be augmented by references to the various East Shore Route exhibits, as well as by more specific descriptions of the issues that make an East Shore Route infeasible. (See Companies' Exhibit Nos. 14, 21, 18, 91, 94, 101, 104, 105a, 131, 152, and 155, Companies' FOF ¶¶ 310 – 335).

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 267 | This Finding implies that the "East Shore Route" consists of one potential alignment. This is not the case, as various alternative routes were evaluated under the catch-all "East Shore Route" terminology. See Companies' FOF ¶¶ 310 – 311 for a summary description of the East Shore Routes. |
| 268, 269, 270 | These paragraphs explain the three segments that comprise the "East Shore Route". They should be grouped under one Finding. |
| 271 | This paragraph should refer to the complexity of the detailed analyses that were performed by PowerGEM and the ISO-NE SWCT Working Group to assess the "one-line" (i.e., use of the existing 387 Line) option, and also incorrectly states that an "East Shore Route" would "work" if a second line were installed to East Shore. More details or references need to be provided regarding both the review of the 387 "one line" option (refer, for example, to Companies' FOF ¶¶ 312 – 315) and the subsequent analyses of the feasibility of installing a second 345-kV line within the existing 387 Line ROW or along the Amtrak / Airline railroad corridors (See Companies' FOF ¶¶ 316 – 327). |

| | |
|---|---|
| 272 | This paragraph should be expanded to capture the range of issues that make any "East Shore Route" impractical. For example, the 50% more vegetation that would have to be cleared refers to the 387 Line segment only.<br><br>The rationale for the elimination of the "East Shore Route" as a viable option for the Project, which is clearly enumerated in the record, should be summarized and referenced. (See Companies' FOF ¶¶ 311, 334 – 335 and to the Exhibits cited therein.) |
| 273 -275, 277-281 | All of these paragraphs relate solely to the 387 Line, which is just one alternative that was considered for the Beseck to East Shore Substation portion of the "East Shore Route". These paragraphs should be grouped together and presented as part of an overall discussion of the 387 Line segment. |
| 276 | This paragraph refers to the East Shore to East Devon segment of the "East Shore Route". It should note that for this segment, both upland and marine/upland routes were evaluated. (See Companies' FOF ¶¶ 328 – 333 and to the Exhibits cited therein.) |

**Comments on ¶¶ 282 – 307**
**"Environment"**

**General Comments**

The findings on environmental matters should reference the comprehensive environmental characterizations and impact / mitigation evaluations that were prepared for the Docket.

The Companies' Application devoted 77 pages in Volume 1 to data characterizing existing environmental conditions along the proposed Project route and at substation / switching station facilities, and 61 pages to identifying and evaluating potential environmental impacts and mitigation measures. Environmental analyses were similarly conducted for Alternatives A and B, and environmental factors also were key considerations in the evaluation of all route and site alternatives for the Project.

Volumes 2, 3, 4, and 8 of the Application include detailed environmental reports covering wetlands and watercourses, cultural resources (including archaeological sites, historic resources, and historic resources and potential visual effects), amphibian breeding, bird species habitat, audible noise studies, geologic information, and representative photographs and simulations of the transmission facilities and waterway crossing locations. Volumes 9, 11, and 12 include aerial photograph segment maps that depict land uses and illustrate waterways, wetland boundaries, floodplains, coastal boundaries, etc. Volume 10 includes plan and profile drawings that depict topographic features along the transmission line route.

Environmental matters are key considerations in Project planning, siting, and construction/operation. The environmental information submitted in this docket provides a comprehensive data base for the reasoned analysis of potential environmental effects. (See Companies FOF ¶¶ 638 – 828).

The findings should specifically determine that the Project will not result in any significant adverse environmental effects and that the Council will continue to play a key role in environmental compliance monitoring, by virtue of the D & M Plan approval and construction oversight, during subsequent stages of the Project. (See Companies' FOF ¶¶ 638 – 642, 825 – 828)

Key environmental matters should be address in the findings, by subject area (land use, visual resources, wetlands, amphibians, transportation and measures to minimize traffic impacts during underground cable construction, etc.). Such a discussion could follow a similar format to that presented in the Companies' FOF ¶¶ 638 – 828.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 282 – 285 | These paragraphs all related to amphibian breeding and thus should be grouped together under a subheading. Additional references regarding amphibians are presented in the Companies' FOF ¶¶ 753 – 758. |
| 286 – 293 | These paragraphs pertain to wetlands and should be grouped together. Additional references to the record should be provided (refer, for example, to Companies' FOF ¶¶ 693- 695, 708 – 723). The Project will not result in significant loss of or disturbance to existing wetlands (See Companies' FOF ¶ 708). Note that some information about wetlands provided in the transcript has subsequently been updated (See Companies' Ex. 193). Temporary work sites at structures in wetlands will be limited to significantly less than the typical 10,000 square feet required for upland structure sites and specific data about wetland construction and mitigation procedures will be provided in the D & M Plan (See Companies' FOF ¶¶ 715 – 716, 720)<br><br>The discussion of wetlands should note that tidal wetlands are located along the underground portion of the route, but will be avoided. (See Companies' FOF ¶¶ 721 – 722) |
| 294 | The sentence in this findings is taken from a transcript reference that is out of context. Although certain portions of the existing ROW along which the Project will be located contain more wetlands than others, the Companies have committed to minimize effects on all wetlands to the extent possible. Specific measures |

| | |
|---|---|
| | to minimize adverse impacts to wetlands will be reflected in the final Project design. (See Companies' FOF ¶¶ 708, 713, 714, 715, 717, 718, 720) |
| 295 | This paragraph should be expanded to capture data regarding the Companies' ROW maintenance program; analyses of bird species that could inhabit the vegetative communities along the ROW; and the fact that shrubland habitat, such as that characteristic of transmission line ROWs, is considered scarce in Connecticut. (See Companies' FOF ¶¶ 759 – 765) |
| 296 | This information regarding conductor pulling would be more properly presented in the construction section of the findings. |
| 302 | With respect to endangered and threatened species, the Companies have consulted with and will continue to consult with the DEP and the U.S. Fish and Wildlife Service. Both of these agencies provide input to the U.S. Army Corps of Engineers, which handles water resource permitting. Data regarding endangered and threatened species is contained in the Companies' FOF ¶¶ 766 – 770. |
| 303 -307 | No comments on specific SCCRWA topics. However, if this section is intended to relate to public water supplies and / or water quality issues, additional references in the Docket need to be cited and the discussion needs to be expanded. (Refer, for example, to Companies' FOF ¶¶ 693 – 695; 724 – 727) |

**Comments on ¶¶ 308-322**
**"Gas Insulated Transmission Lines"**

**General Comments**

The findings should include a specific statement that the use of GITL is not a technologically feasible option for the Project. The findings should also discuss the limited application of GITL technology to relatively short lengths on utility controlled property, including an express finding that GITL is not technologically feasible even for a one-mile section, as corroborated by ISO-NE and KEMA. (See Companies' FOF ¶¶ 367, 630, 631).

Several of the findings are simply recitations of the positions advanced by the Wilsons' expert Steve Boggs, who was presenting GITL as one potential option to avoid use of his clients' property for the bypass. Some of these opinions are not necessary to the Council's decision and should be deleted. See, e.g., comments below regarding Council's FOF ¶¶ 318, 320.

**Detailed Comments**

| Paragraph(s) | Comment |
|---|---|
| 308 | The finding should be deleted because it simply concerns the practices and experience of one GITL manufacturer, CGIT. As recommended above, a more general overview of GITL is needed at the beginning of this section, such as that provided by the Companies' FOF ¶¶ 367, 630, and 631 |
| 309 | The finding could be improved by making it more general: "Gas-insulated lines can be installed either at ground level or in a covered trench in the ROW." |
| 310 | The statement supported by the transcript is: "The recommended phase to phase separation for a 345-kV GITL line is 22 inches. The trench would have to be 2 to 3 feet in depth. For 6 phases, a trench 15 feet wide would be needed. The diameter of the tube containing each phase is approximately 15 inches." |
| 312 | Delete. This paragraph could be construed to mean that GITL is technologically feasible at Royal Oak. |
| 314 | The finding should be revised to make it clear these are applications on utility controlled property. Also, the phrase "long run" is ambiguous and should be deleted. The recommended wording is: "Examples of GITL installations on utility control property are found at the Seabrook Nuclear Station and in the Con Ed system." |
| 316 | Insert "wide" after "10 to 15 feet" |
| 317 | This finding indicates that magnetic fields for GITL are relatively low, while ¶ 322 states that magnetic fields 1 meter above a GITL would be approximately 30 MG. The Council should have a single finding regarding magnetic fields for GITL. |
| 318 | Delete. This finding is not necessary and simply represents the opinion of Steve Boggs. In this docket, the Council need not make a determination of when, if ever, EMF shielding would be required for GITL. |
| 320 | This finding is unnecessary and should be deleted. This was simply the recommendation of Steve Boggs, the Wilsons' expert. |
| 321 | The statement supported by the transcript is: "The GITL system at 345-kV has a much longer operating history – 30 years – than 345-kV XLPE cables. |
| 322 | See comment above for ¶ 317. |

**Comments on ¶¶ 323-335**
**"XLPE"**
**"Avalanche Effect"**
**"Failure Rates"**

**General Comments**

**Additional Background Information Regarding Cable Technology**

This section appears to be largely based on excerpts from cross-examination of the Companies' witnesses regarding cable issues. The Council may wish to expand the Findings, citing the Companies' investigation of cable technology, as outlined in ¶¶ 226-227, 605-620 of the Companies' FOF, including the citations to the record contained in those proposed findings. This will provide additional structure and content for this section.

**Reliability of 345-kV XLPE Cable**

Although ¶ 323 of the Council's findings indicates that 345-kV XLPE cable is now deemed "more reliable," the Council should include in this section a finding that the use of 345-kV XLPE cable, as proposed in the Project, is reliable. The finding could be similar to finding #13 found on the document entitled "Determining the Maximum Feasible Length of Undergrounding", which was distributed at the Council's March 23rd meeting. The findings should also note that both ISO-NE and KEMA concluded that 345-kV XLPE cable is reliable. *See* Companies' FOF ¶¶ 617 and 618.

**Findings Regarding HPFF Cable and interfaces between HPFF and XLPE cable.**

There are several findings that concern HPFF cable either wholly or in part. (Council's FOF ¶¶ 324, 327, 332, 333, 334 and 335). To the extent that these findings serve as a comparison to XLPE cable, they are relevant and add background. However, the findings in Council's FOF ¶¶ 333-335 only concern HPFF cable and ¶ 324 concerns interfaces of HPFF and XLPE cable. These paragraphs are of limited relevance given that the Project as modified does not use HPFF cable and should be deleted.

**Detailed Comments**

| Paragraph(s) | Comment |
|---|---|
| 323 | Delete "than previously" |
| 324 | Delete (see general comments above) |
| 328 | The statement supported by the transcript is: "The applicant expects that traffic induced vibrations will not adversely affect the reliability of the 345-kV XLPE cables because the retainment of the splices will [to] be sufficiently designed with appreciable margin such that any movement of the cable would not be within the splices." |
| Heading before 330 | This heading should read "XLPE Failure Rates" |

| | |
|---|---|
| 332 | The last sentence should be modified to read "In XLPE, locating a fault is much more difficult because [of] you have to use a variable frequency source." |

**Comments on ¶¶ 336-360**
**"DOT"**

**General Comments**

As currently drafted, several of the findings incorrectly suggest that the Council must adopt the DOT's positions on underground construction issues. Many of the findings in this section are simply a recitation of DOT testimony regarding its positions on such issues as routing (¶ 336), burial depth (¶ 338- 340, 347, 348), construction hours (¶ 341, 352), progress reports (¶ 343), trenching length and plating (¶ 353), and splice vault locations (¶ 360). The disagreements between the Companies and the DOT regarding underground construction center around these issues, and the Companies are requesting that the Council exercise its jurisdiction over the DOT and resolve these construction issues in its decision and order and opinion. (*See* section VII of the Companies' Post-Hearing Brief dated March 16, 2005 and pp. 100-01). Contrary to the implications of some of the Council's draft findings (see, e.g., ¶ 341: *"The DOT would require that construction work be done at night ... "),* the DOT's position is not determinative, as the Council has jurisdiction regarding construction of a facility. The findings might be clarified if the Council had a single finding setting forth the DOT's position on these various issues.

The Council should include a finding as to the Companies' position on these underground construction issues. These positions are set forth in section VII of the Companies Post-Hearing Brief (pp. 100-101) and in Companies' Ex. 54, Testimony of Zaklukiewicz dated April 8, 2004 (p. 39), in which the Companies testified that the DOT positions on burial depth, construction hours, repaving, and underground construction will adversely impact cost, schedule and the ampacity/performance of the cables.

The findings regarding DOT positions on routing (FOF ¶¶ 336, 344-346, 354-358) would be better placed in the portion of the findings regarding routing issues. In addition, the Council may wish to supplement these findings with the information found in the Companies' Proposed FOF ¶¶ 375-376.

The Council's FOF ¶359 suggests that the B-N encroachment agreement will provide the guidelines for the basis terms of the M-N encroachment agreement. This is incorrect. There will have to be separate negotiations for the M-N encroachment agreement because this is a different project. Moreover, UI was not even a party to the B-N agreement and thus cannot be bound by its terms in any manner.

**Detailed Comments**

| Paragraph(s) | Comment |
|---|---|
| 338, 341, 352, 353, 360 | See first general comment above. The finding suggests the DOT position is determinative. In addition, the Companies' positions should be noted in the findings. |
| 342 | This finding is duplicated in ¶ 350 and should be deleted. |
| 347 | Change "would block all" to "might affect future" |
| 348 | This is an accurate statement of DOT's concern regarding HPFF cable installation. However, XLPE cable, unlike HPFF cable, does not require continuous splicing, and therefore the relevance of the finding is minimal for the project as modified. (See Companies' Proposed Finding ¶ 607) |
| | |
| 359 | See general comment above. In addition, the Council may wish to note that the encroachment agreement for B-N, a project certified in the summer of 2003, had still not been executed by the end of September 2004. This delay in the B-N agreement provides the basis for the Companies' concern regarding DOT-driven delay for the M-N project. |

**Comments on ¶¶ 361-378**
**"KEMA"**

**General Comments**

This section appears to be solely derived from KEMA's testimony on 12/14/04 and does not contain any references or updates reflecting the KEMA White Paper dated 1/18/05, KEMA's engineering summary of the 2/14/05 Technical Meeting, or KEMA's testimony on 2/17/05. As a result, the section is incomplete in that it does not reflect KEMA's final conclusions in this docket. The Companies recommend that the Council supplement this section to include the type of chronological summary of KEMA's work outlined in the Companies' FOF ¶¶ 585-598, including citations to all KEMA exhibits and testimony referenced therein.

**Detailed Comments**

| Paragraph(s) | Comment |
|---|---|
| 366 | Delete. This finding is inconsistent with KEMA's final conclusions in this docket. |
| 371 | This finding reflects KEMA's testimony regarding its October 18, 2005 report. The finding should be updated to reflect KEMA's ultimate conclusion that undergrounding beyond 24 miles is not technologically feasible. |
| 374-376 | These findings are based upon KEMA's preliminary review of C- |

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|---|---|
| | filters and should be updated or deleted. Paragraph 17 of the findings entitled "Determining the Maximum Feasible Length of Undergrounding" distributed at the Council's 3/23/05 meeting provides the appropriate update. |

**Comments on ¶¶ 379-450**
**"ROC"**

**General Comments**

- Like the "KEMA" section, the ROC section is based on testimony, specifically, the testimony of the ROC group witness panel from the hearings on January 11th and 13th. As a result, the section needs to be updated to reflect the results of the 2/14/05 technical session and the testimony of the ROC group on 2/17/05 following that technical session. In addition, the organization of this section also appears to flow from the testimony of January 11th and 13th, and therefore the section fails to capture the chronology of the ROC group, i.e., when and why it was set up, the course of studies it pursued, and the conclusions it eventually reached. Providing this type of chronology at the beginning of the "ROC" findings will provide a better context and organization for the detailed statements of the ROC group witnesses referenced in the Council's current draft of this section. The Council can refer to the Companies' FOF ¶¶ 576-584 for a summary of the ROC group's work, including the work and testimony after January 13th, and to provide comprehensive citations to the record regarding ROC.

- Council's FOF ¶¶ 384, 428-432 concern the ROC group's review of ABB's DC proposals. These findings should be combined with the discussion of DC alternatives found at Council's FOF ¶¶ 102 et seq.

- Since most of the testimony of the ROC panel on January 11th and 13th concerned the ROC report, citations should be added to the ROC Report where appropriate.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 383 | Insert "KEMA proposal for the" before use |
| 384 | Move to DC Alternatives Section or delete. (See General Comment above) |
| 386 | Revise the second sentence to read: "From a strictly engineering viewpoint, the preference of the ROC would be to have four or thirteen miles of underground cable because it would be less risky. |
| 387 | To more accurately reflect the transcript, revise the finding to state: "Based on the studies conducted by the ROC Group, ISO-NE does not support installing more than 24 miles of underground cable. If the Council were to approve the |

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|---|---|
| | transmission line with more than 24 miles of undergrounding, many more studies would be required to attempt to show ISO-NE that the additional undergrounding would work before ISO-NE could support the project. If studies do not support additional undergrounding, ISO-NE would not approve the project and the transmission line could not be built." |
| 388 | Revise as follows: "The charge of the ROC was to determine the maximum linear length of undergrounding that is technologically feasible consistent with reliability and operability requirements. Companies' Ex. 147 (Reliability and Operability Committee Report, dated August 16, 2004, p. 1). " |
| 390-391 | Delete. These findings are not needed to summarize the work of the ROC group or the basis for its conclusions. In ¶ 391, "mW" should be "MW" |
| 392-393 | Combine into a single finding since the issues are related |
| 395 | Move this finding to the discussion of Alternative A beginning at ¶ 195 |
| 398-399 | Delete. These findings are not needed to summarize the work of the ROC group or the basis for its conclusions. If FOF ¶399 is retained, change "on rotating feeder" to "or rotating feeder" |
| 400 | Insert "approximately" before 650 |
| 401, 402, 404 | Delete. The findings are not needed to summarize the work of the ROC group or the basis for its conclusions. Moreover, FOF ¶ 401 is incorrect: the results are located later in the report. If FOF ¶ 402 is retained, delete the second sentence as it is duplicative. If FOF ¶ 404 is retained, "GE Report" should be changed to "ROC Report" |
| 406, 407 | Delete. These findings are not needed to summarize the work of the ROC group or the basis for its conclusions. Moreover, as Eric Gunter explained, these results simply represent results based on a particular set of assumptions and that there is a clear trend to increased risk as the amount of undergrounding increases. (1/13/05 Tr. at 23-25 ) |
| 408 | Delete/duplicative of ¶ 381 |
| 419 | Change "would" to "may" |
| 420 | Revise to: "The purpose of having only one of the Bethel-Norwalk cables in operation in a study is to reduce capacitance from the system." |
| 422-423 | Delete. These findings are not needed to summarize the work of the ROC group or the basis for its conclusions. |
| 424 | Change "install" to "replace" |
| 425 | The finding should be revised as follows for consistency with the transcript: "In the gas insulated substations to be built at Singer and Norwalk, the applicant will use 500 kV circuit breakers with pre-insertion resistors." |
| 426 | This finding suggests that the Companies have intimated it would |

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|---|---|
| | be possible to install more than 24 miles of undergrounding. The finding should be clarified since the Companies provided this response when asked to assume that they "had" to install additional undergrounding. |
| 428-432 | Move to DC alternatives discussion or delete (see general comment above). In ¶ 432, change "reliable" to "credible" |
| 433 | Delete. This finding is not needed to summarize the work of the ROC group or the basis for its conclusions. |
| 435 | For clarity, revise the first sentence as follows: "The 13 mile case (Case 2) would be the preferred alternative over the 24 mile case from an engineering viewpoint." |
| 437 | This sentence needs to be reworded for clarity: "Assuming the change out of substation equipment as described in the ROC Report, the 24 miles case is technologically feasible." |
| 438, 441 | Delete. These findings are not needed to summarize the work of the ROC group or the basis for its conclusions. |
| 443 | For clarity, revise as: "ISO generally supports the use of both HPFF and XLPE technology, assuming that best practices are followed." |
| 446 | Change "east" to "northeast" |
| 447 | Delete. This findings is not needed to summarize the work of the ROC group or the basis for its conclusions. |
| 449 | The finding as written is incorrect and should be changed to: "The Companies want a minimum of three [two] cables between Beseck and East Devon so that two cables are available if one cable should fail." |
| 450 | This finding should be moved to the DOT section of the findings. |

**Comments on ¶¶ 452-458**
**"C-Type Filters"**

**General Comments**

The discussion of C-Type Filters, relies entirely on one hearing day's transcript citations and thus does not take advantage of extensive information presented by the Companies and KEMA in exhibits. See Companies' FOF ¶¶ 589, 590, 597 and 621-23.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 452 | Change "...on an isolated capacitor bank, as a research project. In that case, if the capacitor..." to "...on an isolated capacitor back, as a research project, because if the capacitor..." |
| 455 | Change to read "C-type filters [are] have not been used for mitigation in [transmission] transition stations." |

| | |
|---|---|
| 458 | Delete "with GE Energy" |

**Comments on ¶¶ 461-463**
**"Areas of Agreement"**

**General Comments**

The Council may want to consider providing introductory paragraphs that explain how the "Areas of Agreement" came to be. Additionally, the Companies respectfully suggest that the Council consider a finding of fact that discusses the February 14, 2005 technical session and the position statements of the participants to the session. See Companies' FOF ¶¶ 35, 585-598.

The discussion of gas insulated transmission lines (FOF ¶463) states only that "there is not much utility experience" with GITL. The Council may wish to include the other historic operational limitations of GITL such as (i) it has not been used in long distance transmission lines; (ii) it is typically used only on utility owned property; (iii) the need for an open cover; (iv) safety concerns; and (v) environmental concerns. See Companies FOF ¶¶ 366-67.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 460 | Relocate this finding to the discussion of "safety zone" in the "additional undergrounding" section. |

**Comments on ¶¶ 464-481**
**"Construction – Additional Undergrounding"**

**General Comments**

Suggest deleting the header "Construction" and renaming the header "Additional Undergrounding".

The discussion relies entirely on one hearing day's transcript citations and thus does not reference the extensive information presented elsewhere in the docket. See Companies' FOF ¶¶ 552-637.

The Council's discussion on the "safety zone" does not describe why it is relevant. The Companies suggest that the Council include the discussion of the relevance of the "safety zone" found in the Companies FOF ¶¶ 599-604.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 466 | Change "The applicants did not propose 28 miles" to "The applicants did not propose 18 miles". |
| 468 | The findings should more thoroughly discuss why the surge arrestors are being replaced and should discuss the other mitigative measures that must be taken in order to make 24 miles of underground cable technically feasible. See Companies FOF ¶ 583. |
| 469 | An additional citation: *Council's Ex. 25* (KEMA Inc. engineering summary of the February 14, 2005 technical meeting dated February 16, 2005, p. 2-3) |
| 471-472 | Move these findings to the C-Type Filter discussion FOF 452-458. |
| 474 | Delete. |
| 477 | Delete second sentence. |
| 481 | The cited testimony does not support the statement that the 24 mile underground system is 4 to 5 miles over the safety margin. |

**Comments on ¶ 482-487**
**"Proposed Undergrounding"**

**General Comments**

Each FOF relies entirely on one statement made during one hearing day and thus does not take advantage of extensive information presented elsewhere in the docket. See Companies' FOF Section 15 (¶¶ 552-637) for additional citations.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 483-485 | Change "Tr. 7/27" to "Tr. 7/27/04". |
| 486 | Change "XLPE 138Kv" to "XLPE 138kV". |

**Comments on ¶ 488-493**
**"Porpoising, Vaults and Split-Phasing and Reliability"**

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 488 | Recommend replacing the first paragraph with "Combining overhead and underground sections in the same circuit (sometimes referred to as "porpoising") exposes the transmission line to an increased risk of damage due to overvoltages caused by lightning strikes and switching events on the network." and adding the following to the citation: "Companies' Ex. 1 (Application, Vol. 1, p. H-49); 6/1/04 Tr. at 238 (Zaklukiewicz)." |
| 489 | Add pages 30 and 41 to the citation. |
| 492 | Change "Tr. 4/22" to "Tr. 4/22/04". |
| 493 | Add citations found in Companies' FOF ¶ 517. |

**Comments on ¶ 494-505**
**"Horizontal Drilling and Boring"**

**General Comments**

Companies' Exhibit 171 revises the methods by which several water bodies will be crossed. The testimony from April 2004 referenced in the Council's FOFs should be read in conjunction with that Exhibit. See Companies FOFs ¶ 702-707.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 494 | The cable system will be installed across watercourses using techniques appropriate to the width, depth, and location of the watercourse. The larger crossings (i.e., the Housatonic, Pequonnock, Saugatuck rivers) will be installed using HDD. The Yellow Mill Channel and one of the Norwalk River crossings will be installed using open cut techniques. Smaller streams will be crossed by installing the cable system either within the road ROW (above or below a culverted stream) or on existing bridges. Companies' Ex. 1 (Application, Vol. 1, pp. M-7 to M-8); Companies' Ex. 53 (Testimony of Mango, April 8, 2004, pp. 11-13); Companies' Ex. 171 (Revised Table J-2); Companies' Ex. 54 (Testimony of Zaklukiewicz, April 19, 2004). |
| 495 | Add pages 30 and 41 to the citation. |
| 492 | Change "Tr. 4/22" to "Tr. 4/22/04". |
| 493 | Add citations found in Companies' FOF ¶ 517. |

| | |
|---|---|
| 503 | Delete. This FOF is in the wrong place and covered by the "Cost" section |
| 504 | Relocate. This FOF does not concern HDD and boring and jacking |
| 505 | Delete. This FOF is in the wrong place and covered by the "Cost" section |

**Comments on ¶ 506-510**
**"Pipe Protection and Leaks"**

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 508 | Insert "in the pressurizing plant" following "levels of leak detection". Delete "super" before "sensitive" |

**Comments on**
**"Determining the Maximum Feasible Length of Undergrounding"**
**(separate handout from Council's 3/23/05 meeting)**

**General Comments**

The Companies assume that it is the Council's intention to insert these separately numbered findings at an appropriate location within the discussion of underground issues.

The transcript from the February 14, 2005 Technical Session is not in evidence. The Companies suggest that, instead of citing to this transcript, the Council rely upon the summaries of the Technical Session filed by KEMA, ISO-NE and the Companies, which were admitted into evidence as Council Exhibits 25 and 26, and Companies' Exhibit 199, respectively.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 3 | Additional citations: Companies' Ex. 176 (Reliability and Operability Committee (ROC) Report dated December 20, 2004, pp. 5, 19, 27-28); Companies' Ex. 164 (Interim Report of the Reliability and Operability Committee, dated October 8, 2004, p. 3); Companies' Ex. 147 (Reliability and Operability Committee Report, dated August 16, 2004, pp. 2, 9, 13); Companies' Ex. 44, Response to CSC-01, Q-CSC-028); 2/14/05 Tr. at 25, 27 (Whitley); ISO-NE's Ex. 8 (Testimony of Whitley, June 7, 2004, pp. 6-11, 12). |
| 4 | Additional citations: Companies' Ex. 44, Response to CSC01, Q-CSC-028; Companies' Ex. 1 (Application, Vol. 1, H-49); ISO- |

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| | NE's Ex. 8 (Testimony of Whitley, June 7, 2004, pp. 6-7).<br><br>Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have a page 15. |
| 5 | Delete "...(t)he" and replace with "The"<br><br>Delete "example)..." and replace with "example)." |
| 6 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have a page 15. |
| 8 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have a page 21.<br><br>Suggest citation be changed to: Companies' Ex. 176 (Reliability and Operability Committee (ROC) Report dated December 20, 2004, pp. 6-7, 16, 21-22); 1/13/05 Tr. at 48-50 (Gunther); 2/17/05 Tr. at 79-80, 95-96, 108-09, 119-120 (Prete and Gunther) |
| 9 | The February 14, 2005 Technical Session transcript is not in evidence and should not be cited. Alternative citations for this FOF can be found in the Companies' FOF ¶¶ 597<br><br>Additionally, the statement that TOVs become higher as the total length of underground cable increases is found in the Companies' Ex. 176 (Reliability and Operability Committee (ROC) Report dated December 20, 2004, pp. 27)<br><br>Suggest both figures be labeled. |
| 10 | The February 14, 2005 Technical Session transcript is not in evidence and should not be cited. Alternative citations for this FOF can be found in the Companies' FOF ¶¶ 597. See also:<br><br>(i) The EnerNex studies demonstrated that there are changes in the resonance characteristics of the system if underground cable is extended beyond the 24 linear miles proposed for the Project. 2/17/05 Tr. at 22-23, 51 (Enslin and Wakefield).<br><br>(ii) After the technical meeting, KEMA analyzed the additional study results presented at the meeting, considered the discussion at the meeting, and analyzed in more detail the data included in Appendix E to the December 20, 2004 Final ROC Report. KEMA concluded that a more thorough analysis had been conducted by the ROC Group than had been apparent from the discussion in the body of the ROC Report. The data indicated a greater number of high TOVs, and a higher severity of the TOVs that are possible, than had been evident in the text of the December 2004 ROC Report. 2/17/05 Tr. at 26, 46-47, 50 (Enslin and Wakefield). |

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| 11 | The testimony of KEMA witnesses does not support the first sentence of this FOF. KEMA testified that while 5 miles of additional underground cable may be technically feasible with additional C-Filters, using C-Filters is not wise. Thus, KEMA advised, in sum, that although C-filters, if tried, might prove to be technically feasible, they also might not, and it would be unwise to take the risk of building a system that depended on them without knowing. 2/17/05 Tr. at 25-26 (Enslin and Wakefield).<br><br>The February 14, 2005 Technical Session transcript is not in evidence and should not be cited. Alternative citations for this FOF can be found in the Companies' FOF ¶¶ 590, 591, 594-598. |
| 12 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have pages 18 and 19.<br><br>Additional citations in support of this FOF can be found in the Companies' FOFs ¶¶ 21, 89, 91, 571 and 583. |
| 13 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have a page 19.<br><br>Additional citations for this FOF can be obtained from the Companies' FOF Section 15.6 "Reliability of XLPE 345-kV Underground Cable" |
| 14 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have a page 22. |
| 15 | Delete: "Appendix B" in citation. Appendix B of the December ROC Report does not have pages 10 and 11. |
| 17 | Suggest the citation be expanded: 2/17/05 Tr. at 16 -17, 33-34, 44-45, 63, 90-92, 120-22 (Wakefield, Enslin, Pratico and Zaklukiewicz). |

**Comments on ¶¶ 511-538**
**"Buffer Zone"**

**General Comments**

This section, captioned "Buffer Zone," includes proposed findings concerning the Companies' proposed definition of "Residential area," split-phasing, the 15 GW and 27.7 GW Cases, magnetic field levels from distribution lines and 115-kV lines, and strategies for reducing magnetic fields.

**Buffer Zones**

Most of the draft findings in this section are only indirectly relevant to the buffer zone issue. For additional appropriate findings concerning buffer zones, please see the Companies' FOF, ¶¶ 545-

551. The Council's draft findings under "Standards/Prudent Avoidance (¶¶ 769-778) are also relevant to the establishing buffer zones on a prudent avoidance basis.

**15 GW Case**
In their March 23, 2005 deliberations, the Council suggested that additional findings be drafted that explain why the 15 GW Case provides a reasonable basis for calculating magnetic fields associated with the existing and proposed lines. Detailed proposed findings on this subject, with citations to the record, may be found in Companies' FOF ¶¶ 496-509. The reasonableness of the 15 GW Case is also explained, with citations and excerpts from exhibits in the Companies' Post-Hearing Brief, at 76-81.

**Common Magnetic Field Sources Other than the Proposed Transmission Lines**
A more comprehensive summary of this evidence than appears in the draft findings is set forth in the form of a Table at pp. 63 and 64 of the Companies' Post-Hearing Brief.

**Split–Phasing and Magnetic Field Reduction Strategies Generally**
There are more detailed findings concerning strategies for magnetic field reduction, including split-phasing at ¶¶ 707-718 of the Council's draft. The paragraphs in this section should be moved to the discussion starting at ¶ 707, and duplication eliminated. Strategies for reducing magnetic fields, and the process by which the low magnetic field line designs were developed in this Docket, are described in more detail in the Companies' FOF ¶¶ 513-526. The Council may wish to include many of these findings to "tell the story" of its extensive investigation of these strategies. See also, Companies' Post-Hearing Brief, at 73-75.

**Detailed Comments**

| Paragraph(s) | Comment |
|---|---|
| 513 | The Findings should be revised as follows:<br>"Companies determined that one house in Durham encroaches within the ROW." (2/1/05 Tr. at 171 (Bartosewicz)). |
| 515 | The statement supported by the transcript citation should read:<br>"All calculations provided by the applicants of magnetic fields associated with split-phased line designs assume that the conductors are optimally phased." |
| 516 | The statement supported by the transcript cite is:<br>"A split phased configuration may be transitioned to another line configuration, such as one that combines the 345-kV and 115-kV lines, within a few spans, except that where there are severe angles in the right of way, a change from split phasing to two vertical structures would be problematic." This concept is stated correctly, but in less detail in ¶ 711 of the Council's draft. Paragraph 516 could be deleted, rather than restated as above. |
| 521 | The quoted statement refers to the "right-of-way by Ezra Academy." It is not true of the entire line. |
| 524 | The cited testimony does not refer to EMF "reading[s]" but to calculations of the magnetic field at the portion of the facility |

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| | nearest to the lines, using the 15 GW Case. In addition to the citations included in this paragraph, see Companies' Ex. 124, Supplemental Testimony II of Bailey, p. 7. |
| 525 | In the cited testimony concerning distribution line magnetic fields, Dr. Johnson said that he had seen fields under distribution lines of "8, 10, 12 mG...:" He did not say that 12 mG was the upper limit of distribution line fields. In his pre-filed testimony of Oct. 12, 2004 (Companies' Ex. 165, p. 2, Dr. Johnson reported that distribution lines along streets "produce magnetic fields in the range from less than a milligaus (mG) to more than 20 mG.") Thus, this finding should be amended to change "12 mG" to "more than 20 mG" and to add a citation to Companies' Ex. 165, p. 2. |
| 526 | Insert "directly" before "under". |
| 527 | The Council noted that this paragraph needs to be corrected in its March 24, 2005 deliberations. The correct statement appears in the corrected ¶ 516 above. See also, Companies' FOF ¶ 526. |
| 529 | The paragraph is correct except for the statement that "Split phase means using an ABC configuration on one side and CBA on the other." In fact "'Split-phasing' is a configuration in which the current flow is "split" among six, rather than three conductors." The six phases are then "optimized" for cancellation as described in the draft finding. There is a correct description of split-phasing at ¶ 708 of the Council's Draft FOF. See also Companies' FOF ¶ 515. |

**Comments on ¶¶539-631**
**"Cheshire to Milford and Durham"**
**"Royal Oak Bypass"**
**"Black Walnut Hill Drive and Majestic Oak Estates"**
**"Meriden, Milford and Stratford"**
**"Wallingford"**
**"Westport"**
**"Woodbridge"**

**General Comments**

When citing structure heights, the height should be identified as "typical" heights. Structure diagrams should be referenced to a cross section diagram to give a visual representation of the typical structure.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 539 | Additional visual detailed information is present in Companies' Exhibit 191 |
| 540 | Additional detailed data regarding split phase can be found in detail in appendices of the Companies' FOF. |
| 541-542 | There are a total of 15 residences along the ROW in Durham at 6mG or higher, calculated at the 15GW load level and applying the as "Proposed" composite 345kV/115kV structure. Detailed information can be found in the response to CSC interrogatory 92. |
| 544 - 548 | More detailed information regarding the "Royal Oak By-Pass" can be found in the Companies' FOF Appendix tab 5. |
| 548 | This is incorrect, the bypass for the 345kV line would be 125 feet wide using the typical 150' split-phase structure. Companies' Exhibit 191. |
| 551 | Need to clarify what type of structure base is being described. Straight, angle, etc. |
| 557 | Additional citation, Companies' FOF Appendix tab 5. |
| 558 | The magnetic field levels measured correlate to a line loading of 77.1 amperes. This is a measured value for a specific day of the year and time. (2/17/05 Tr. at 245-246 (Bartosewicz)). |
| 571-572 | Magnetic field and cross section information can be found in the Companies' FOF Appendix, tab 1, pages 91-93. |
| 579 | Cross Section 6 consists of two segments, 6 East and 6 West. The information in this FOF for 6 West which has no residential areas and one abandoned statutory facility. |
| 580 | Additional information on options for this area in Wallingford is contained in Companies' Exhibit 202. The table in this exhibit shows the calculated magnetic field levels at each house for the two designs described. The "best design" would also eliminate one structure. |
| 584 | This is described as having "lines" on each side of the structure. The term "lines" should be translated to one 345kV circuit on side of the structure and one 115kV circuit on the other side of the structure. |
| 587 | Reference Companies' Exhibit 202. |
| 599 | This is not applicable any longer since the cable technology has been changed from HPFF to XLPE. |
| 609 | Diagrams of the structure designs through the JCC can be located in the Companies' FOF Appendix 5, pages 16-17 |
| 613 | Diagrams of "Option B" through the JCC can be located in the Companies' FOF Appendix 5, page 15. |
| 617 | Diagrams of "Option A" and "Option B" through the JCC can be located in the Companies' FOF Appendix 5, pages 14-15. |

**Comments on ¶¶ 632-689**
**"Electric and Magnetic Fields"**

## General Comments

**Scientific Research Concerning EMF Health Effects**
These paragraphs include several discrete Findings concerning scientific literature related to the health effects of EMF. However, the draft Findings as a whole do not capture the vast scope of the literature of which the Council has taken administrative notice and received in evidence, or the scope of the effort over the last 30 years to investigate the suggestion that transmission line magnetic fields may cause adverse health effects, in particular, leukemia in children. The Companies ask the Council to consider incorporating some or all of their proposed Findings concerning this literature – Companies' FOF ¶¶ 484-493. While the Findings themselves are short, the number and breadth of the citations supporting the requested Findings correctly portray the Council's broad and intense efforts to investigate this issue.

**Best Management Practices**
The draft Findings do not include a finding that the project will be consistent with the Council's Best Management Practices. Such a finding should be made. The Companies' brief includes proposed Findings showing how the application as filed complied with the BMP then in effect, and how over the course of the docket, the Council required the development of additional field reduction strategies. See especially, Companies' FOF ¶ 543, which should be incorporated in the Council's finding (although references to the now rescinded December 2004 BMP's can be deleted). See also, Companies' FOF ¶¶ 510-513.

**Dr. Ginsberg**
Dr. Ginsberg's statements should be attributed to him, rather than stated in the abstract; and care should be taken to distinguish between his evaluation of the scientific literature; his recommendations concerning exposure levels for which prudent avoidance measures may be considered; and his disclaimer of any standing to recommend what levels of investment would be prudent to reduce exposures. As Dr. Ginsberg repeated many times, the exposure levels to which he referred in his testimony are **time weighted averages**, and this important fact should be consistently recognized in the Findings.

## Detailed Comments

| Paragraph | Comment |
|---|---|
| 642 | The first sentence should read: "The UK study found ***no*** association between EMF and childhood leukemia." Dr. Ginsberg so testified in his cited testimony. |
| 652 | Dr. Bell's testimony is cited for the statement: "Analysis of a study by Greenland showed that at the 2 to 5 mG range, there was a statistically significant 30 percent increase in the risk of leukemia in children. In the 3 to 5 mG range, there was a |

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| | statistically significant 80 percent increased risk of leukemia in children." The authors of the Greenland study did not claim that their data supported this interpretation. Rather, the claim is a product of the Woodbridge panel's "data-dredging" post hoc analysis. See, cross examination of Dr. Bell, 1/20/05 Tr. at 113-131; Companies' Ex.183, Testimony of Bailey et al., pp. 1, 2; 1/5/05 Tr. at 19-20 (Bailey). This paragraph should be deleted. In the alternative, the paragraph should be rewritten to make clear that the "analysis" was one done for the purposes of testimony in this Docket by Dr. Bell and his colleagues, and not a conclusion of the authors of the Greenland study. |
| 656, 657 | If included in the Findings, these statements of opinion should be attributed to their author, Dr. Ginsberg. |
| 658 | The statement concerning the reported cases before 2000 and in 2000 is not necessary to support the preceding sentence concerning childhood leukemia incidence (1/10,000); and the statement suggests a significance that it does not have. In the cited testimony, Dr. Ginsberg characterized the change in the number of reported cases as likely "anomalous" and "noise." At the same time, he confirmed that they were consistent with his characterization of the leukemia incidence rate as 1 in 10,000. |
| 659 | As the cited testimony recognizes, Acute Lymphocytic Leukemia is a "life span disease" 5/12/04 Tr., at 192 (Bell). The significance of the 1-19 years of age range is that some consider the disease to occur in *childhood* if the subject's age is in that range. See, 7/28/04 Tr. at 250, 251 (Bell). Others define childhood for this purpose as 0-14, as stated in Draft FOF ¶ 669, based on Dr. Ginsberg's testimony. |
| 661 | The statement: "Approximately three to ten percent of all childhood leukemias may be attributed to EMF sources" mischaracterizes the cited testimony. Dr. Ginsberg testified, in the cited testimony, that "**if** these odds ratios are valid", i.e., if magnetic field exposure actually causes leukemia in children, **then** "3 to 10 percent of childhood leukemia would be attributable to EMF." (5/12/04 Tr. at 186 (Ginsberg)). |
| 669 | The finding should reflect (as the preceding paragraph does) that the cited exposures are estimated time weighted average exposures over a 24 hour period. |
| 670 | The statement: "Levels above 6.0 mG are a clear public health concern" should be deleted or, in the alternative, attributed to Dr. Ginsberg and put in context. In the cited testimony, Dr. Ginsberg said: "However, above 6 it's a little clearer to us that there is a stronger concern. It's all in the theoretical range." On that basis, he went on to make the quoted statement. |
| 671 | The cited DPH "recommendation" should be quoted in full: "[B]est management practices should be used to minimize any |

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| . | increase and to keep in mind the potential health risks and what background levels tend to be and try to strike that balance so that there's minimal exposure or minimal increase in exposure." |
| 672 | This effort to compress Dr. Ginsberg's evolving prudent avoidance recommendations into a few sentences is unclear. The fairest way to encapsulate his ultimate recommendation would be to quote or closely paraphrase his ultimate attempt at stating it: "Our recommendation is that a prudent avoidance should begin at levels above 3, but that ...between 3 and 6 is a gray area. Clearly above 6 is a level that we would have a larger public health concern about." (10/14/04 Tr. at 138 (Ginsberg)). Moreover, the finding should make clear that (as stated in the transcript references cited in the draft) Dr. Ginsberg is referring to time weighted average exposures over a 24 hour period. Finally, the statement that "economic investment is not a factor that DPH considers in determining prudent avoidance" should be restated so as not to imply that the DPH considers economic investment irrelevant, but rather that because the DPH are not risk managers, they do not make judgments as to whether any level of investment to avoid the risk is justifiable. (10/14/04 Tr. at 93, 94 (Ginsberg)). |
| 673 | This observation should be attributed to Dr. Ginsberg. |
| 682-685 | These paragraphs relate to the 15 GW Case and should be grouped with the earlier paragraphs on this subject (presently under "Buffer Zones"). See also, the Companies' general comments to ¶¶ 511-538 concerning additional Findings to provide a fuller justification for the 15 GW Case. |
| 686 | The reference to the Lei and Singh study – one of literally thousands of studies that make up the body of EMF health effects literature – should be deleted. This study has not been replicated and has indeed been contradicted by better studies. 5/12/04 Tr. at 202-206 (Aaronson). As the draft is currently configured, this single study of questionable value is given the same prominence as the entire body of experimental evidence evaluated by the NIEHS. |

**Comments on ¶¶ 690-706**
**"EMF Cross Section 1-8"**

**General Comments**

Detailed information on cross section diagrams, magnetic field levels within the ROW and at the edges of each ROW can be found in the Companies' FOF Appendix. pages 1 -93.
Cross Section 1, pages 5-10, Cross Section 2, pages 11-20, Cross Section 3, pages 21-26, Cross Section 4, pages 27-33, Cross Section 5, pages 34-39, Cross Section 6E, pages 40-45, Cross Section 6W, pages 46-51, Cross Section 7, pages 52-57, Cross Section 7B, pages 58-63, Cross

Section 8A, pages 64-69, Cross Section 8N, pages 70-77, Cross Section 8M, pages 78-83, and Cross Section 8S, pages 84-93.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 691 | The representation of Option 3 pertains to the Royal Oak neighborhood and not the entire cross section from Oxbow Junction to Beseck switching station. |
| 697 | Should include in this citation "It is our understanding, and I believe a representative of Wallingford confirmed, that these ball fields have been abandoned. |

**Comments on ¶¶ 707-718**
**"EMF Mitigation Configuration"**

**General Comments**
The discussion of magnetic field reduction strategies, including split-phasing, under "Buffer Zones" ¶¶ 545-551, should be moved here and consolidated, eliminating duplications, and noting the corrections suggested in the Companies' detailed comments.

The discussion of field reduction strategies, including split phasing, relies entirely on transcript citations. The Findings should reference the extensive information presented by the Companies in exhibits. This larger body of evidence concerning strategies for reducing magnetic fields, and the process by which the low magnetic field line designs were developed in this Docket, is summarized in detail Companies' FOF ¶¶ 513-526. The Council may wish to include many of these findings, which reflect the Council's extensive investigation of these strategies. See also, Companies' Post-Hearing Brief, at 73-75.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 707 | This paragraph should be revised, because it contains an error and, to the extent it is correct, it is duplicative of the following paragraph, ¶ 708, and also of ¶ 714, both of which are correct. Paragraph 707 incorrectly states that "Split phase means using an ABC configuration on one side and CBA on the other." In fact as correctly stated in ¶ 708, split-phasing is "a configuration in which a line is constructed using six, rather than three, phase conductor positions." Paragraph 708 goes on to correctly describe optimal phasing of the conductors of a split phased line, which is what the ABC / CBA sentence refers to. See also Companies' FOF ¶ 515. |
| 711, 712, 718 | These paragraphs all deal with the same subject – transitioning |

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| | from a split phased configuration to a single phase configuration. They should be grouped together. |
| 716 | It is not correct that there are currently no split phase installations of transmission lines in Connecticut, as testimony later than that cited in this paragraph established. While split-phasing has not been used specifically for the purpose of reducing magnetic fields in Connecticut, there are lines that have been split-phased for reliability purposes. An example of a split phased line in Connecticut is the existing 115-kV line on the ROW between Cook Hill Junction and East Devon (the 1690 line). 7/27/04 Tr. at 213-15 (Johnson); 7/28/04 Tr. at 103, 104 (Johnson). This configuration is illustrated by the cross-section drawing in Companies' Ex. 1, Volume 10, DWG. NO. XS-001, Figure 8. |

**Comments on ¶¶ 734-768**
**"Buffer Zones for EMF: Durham, Wallingford, Cheshire to Milford and Milford"**
**"Buffer Zones for EMF: JCC, Ezra, and Bethany/Woodbridge"**

**General Comments**

When citing structure heights, they should be identified as "typical" heights. Structure diagrams should be referenced to a cross section diagram to give a visual representation of the typical structure.

**Detailed Comments**

| Paragraph | Comment |
|---|---|
| 735 | Duplicate finding with ¶ 558. Consider deleting. |
| 736 | Duplicate finding with ¶ 559. Consider deleting. |
| 737 | Duplicate finding with ¶ 560. Consider deleting. |
| 746 | DEP does not have to collaborate with Towns. Towns have the Right of Refusal if DEP does not exercise their rights. |
| 748 | Duplicate finding with ¶ 609. Consider deleting. |
| 750 | Transcript citation should be pages 56-57, not just 56. |
| 756 | More detailed information is provided in Companies' FOF, appendix tab 5, pages 10-17. |
| 758 | Duplicate finding with ¶ 627. Consider deleting. |
| 759 | Duplicate finding with ¶ 628. Consider deleting. |
| 760 | More detailed information is provided in Companies' FOF, appendix tab 1, pages 70-77. |
| 761 | Accurately reflects transcript but the logic seems backwards. |

**Comments on ¶¶ 769-778**
**"Standards/Prudent Avoidance"**

## General Comments

In their March 23, 2005 deliberations, Council members asked for a fuller treatment of the concept of "prudent avoidance," not limited to the views of the DPH, and asked that the Findings include, in particular, the views of the World Health Organization. Paragraphs 769-778 provide such references. There are also proposed findings dealing with this issue, including prudent avoidance as it applies to the buffer zone concept, in the Companies' FOF ¶¶533-550. See also, the discussion of California's prudent avoidance policy at p. 110 of the Companies' Post-Hearing brief; and the discussion of Vermont's approach to prudent avoidance at pp. 60-62 and 70, 71 of that brief.

## Detailed Comments

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|---|---|
| 771 | This finding concerning the magnetic field associated with a hair dryer should be moved to be grouped with other findings stating magnetic field exposures from various sources. See, General comments to ¶¶ 511-538. |
| 778 | The finding that the 1993 BMP's were in effect when the application was filed is correct. However, additional findings concerning the consistency of the project with the Council's BMPs are required. See, general comments above. |

**Comments on "Cost Findings"**
**(separate handout from Council's 3/23/05 meeting)**

## General Comments

Paragraph[4] 4, 5, 12, 13 and 16 should be grouped together as they relate to the economic benefits that the result from the proposed project.

## Detailed Comments

| Paragraph | Comment |
|---|---|
| 4 – 5 | Should be classified as economic benefits of the proposed project. |
| 8 | The finding should reworded to clarify that even if a project qualifies for regional cost support, some portion of the project may be determined by ISO-NE to be treated as localized costs. See Applicant FOF ¶ 155. |
| 12 – 13 | Should be classified as economic benefits of the proposed project. |
| 16 | Should be classified as economic benefits of the proposed project. |

[4] The Council's FOF regarding Cost did not include paragraph numbering. For ease of reference, the Companies have numbered each paragraph sequentially.

Respectfully submitted,

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