

1 STATE OF CONNECTICUT

2 SITING COUNCIL

3 Re: The Connecticut Light and Power Company and) Docket 272
4 The United Illuminating Company Application for a)
5 Certificate of Environmental Compatibility and)
6 Public Need for the Construction of a New 345-kV)
7 Electric Transmission Line and Associated Facilities)
8 Between Scovill Rock Switching Station in)
9 Middletown and Norwalk Substation in Norwalk,)
10 Connecticut Including the Reconstruction of)
11 Portions of Existing 115-kV and 345-kV Electric)
12 Transmission Lines, the Construction of the Beseck)
13 Switching Station in Wallingford, East Devon)
14 Substation in Milford, and Singer Substation in)
15 Bridgeport, Modifications at Scovill Rock)
16 Switching Station and Norwalk Substation and the)
17 Reconfiguration of Certain Interconnections) May 3, 2003
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21 **SUPPLEMENTAL TESTIMONY OF ROBERT E. CARBERRY**
22 **AND KATHLEEN M. SHANLEY CONCERNING STATE POLICIES**
23 **WITH RESPECT TO 60-HZ ELECTRIC AND MAGNETIC FIELDS**
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27 Q. Mr. Carberry and Ms. Shanley, please relate how you have become
28 familiar with the development of the policies of the State of Connecticut with respect to
29 electric and magnetic fields associated with power transmission and the use of electricity.

30 A. Until recently our respective responsibilities at Northeast Utilities Service
31 Company and the United Illuminating Company included monitoring the conclusions and
32 advice of scientists as well as public policy developments concerning health research on
33 effects of electric and magnetic fields (EMF) associated with electric power transmission.
34 In that capacity, we monitored EMF research and policy from the time power-frequency
35 EMF first became a matter of public concern in the mid-1970's. Our responsibilities

1 included monitoring the policy statements of Connecticut agencies. We also served for
2 many years on the Advisory Committee that provided information to the State's
3 Interagency Task Force on EMF, beginning with the formation of the Advisory Group in
4 1992, and closely followed the development of the State's policy from that advantage
5 point.

6 Q. What is the earliest publication by a Connecticut state agency concerning
7 EMF of which you are aware?

8 A. In 1990, the State Department of Health Services' Division of
9 Environmental Epidemiology and Occupational Health issued an "Electric and Magnetic
10 Fields Fact Sheet," dated January, 1990¹, which is much like that issued by the
11 Department of Health in January of this year, and is attached as an exhibit to the
12 testimony of Dr. Ginsberg.²

13 Q. What is the EMF Interagency Task Force?

14 A. In 1991³ and 1992⁴, the legislature established an Interagency Task Force
15 ("Task Force") to "study electric and magnetic fields" and "determine the appropriate
16 role of the state in addressing the potential problems associated with electric and
17 magnetic fields." The Task Force was comprised of the Commissioner of Health
18 Services, the Commissioner of Environmental Protection, the Commissioner of
19 Economic Development, the Secretary of the Office of Policy and Management, the
20 Chairperson of the Public Utilities Control Authority, and the Chairman of the
21 Connecticut Siting Council. It was tasked with reviewing and compiling relevant

¹ Exhibit 1 to Companies' "Request to Take Administrative Notice Concerning State Policies with Respect to 60 Hz Magnetic Fields," dated May 3, 2004 ("Request").

² See also, Request Ex. 10.

³ See Public Act 91-217, Request Ex. 1.

⁴ See Public Act 92-169, Request Ex. 1.

1 existing scientific literature concerning possible adverse effects of EMF; determining
2 whether any gaps in the existing literature could be filled by original research in
3 Connecticut; and determining “the need for and the development of recommendations to
4 the public concerning prudent methods of avoiding exposure to electric and magnetic
5 fields.” For its assistance in conducting this work, the Task Force was authorized to
6 assess the state’s electric public services companies for a total of \$150,000, and to
7 contract for the services of electric and magnetic fields experts to assist it. Finally, the
8 Task Force was charged to report to the legislature concerning its activities.⁵

9 Q. Did the Task Force report back to the legislature?

10 A. Yes. The Task Force issued an “Interim Report” dated February 1, 1992,⁶
11 and additional reports published in 1993,⁷ 1994,⁸ 1995,⁹ and 1998.¹⁰

12 Q. You mentioned that you were a member of an Advisory Committee to the
13 Interagency Task Force on EMF. What was the makeup of this Advisory Committee?

14 A. According to the Task Force, it was made up of “members from the major
15 constituencies who may have special knowledge or skills relative to EMF.”¹¹ There is a
16 full list of the names of the Advisory Committee in each of The Task Force Reports
17 from 1993 forward.

18 Q. What was your contribution to the work of the Task Force?

19 A. We provided engineering and technical information on the electric system
20 and its components, and on EMF sources, characteristics and measurement. We also

⁵ Public Acts 91-217 and 92-169, Request Ex. 1.

⁶ Request Ex. 3.

⁷ Request Ex. 6.

⁸ Request Ex. 7.

⁹ Request Ex. 8.

¹⁰ Request Ex. 9.

¹¹ 1992 Task Force Report, Request Ex. 2, Attachment 2: “Proposed Interagency Program for EMF,” at 1.

1 provided information about CL&P's and UI's EMF communication programs, and
2 provided examples of EMF measurements taken at customers' requests.

3 Q. In general, what was the subject matter of the Task Force reports?

4 A. Each of the reports carefully summarized the significant reviews of the
5 published scientific literature relevant to the possible adverse health effects of power-
6 frequency EMF; reviewed relevant regulatory activities in other states and other parts of
7 the world; and made policy recommendations to the legislature.

8 Q. What did the Task Force do to carry out its charge to seek expert advice
9 with respect to determining whether EMF exposure carried a risk of adverse health
10 effects, and what the state's policies should be with respect to EMF?

11 A. The Task Force sought expert advice in several ways. In particular, in
12 1992, it asked the Connecticut Academy of Science and Engineering ("CASE" or the
13 "Academy") to perform an independent assessment of the published scientific literature
14 relating to possible EMF health effects.¹² Also in 1992, the Task Force retained an
15 independent consultant with health science expertise to serve as the Task Force's project
16 manager or coordinator.¹³

17 Q. What is the Connecticut Academy of Science and Engineering?

18 A. It is a non-profit corporation established by a special act of the
19 legislature that is chartered to, among other things, provide reports to the people and
20 government of Connecticut concerning science and public policy. The full statement of
21 the Academy's purposes is found in its charter.¹⁴

22 Q. Did the Academy respond to the Task Force's request?

¹² See, C.A.S.E. "Response to Inquiry," dated April 1, 1992, Request Ex. 4, at 5.

¹³ 1993 Task Force Report, Ex. 6, at 1-2.

¹⁴ CASE Report, Request Ex. 4, at 2.

1 A. Yes. The Academy submitted its “Response” to the Task Force’s “Inquiry”
2 on April 1, 1992. This document is sometimes called the “CASE Report.”

3 Q. Who were the authors of the CASE Report?

4 A. The report was prepared by a committee of scientists led by Jan A. J.
5 Stolwijk, PhD, Professor of Epidemiology and Public Health, Yale University School of
6 Medicine. The other members of the committee were eight scientists affiliated with Yale
7 or UCONN, a scientist employed by Bristol-Meyers Squibb, and David Carpenter, M.D.,
8 then Chairman of the School of Public Health of the University at Albany.

9 Q. Who served as the Task Force’s EMF Coordinator?

10 A. The first coordinator was Andrea Boissevain, of Health Risk Consultants.
11 She was very involved in the production of the 1993, 1994, and 1995 Task Force reports.
12 Some time after the 1995 report was issued, a health department employee, Carolyn Jean
13 Dupuy, filled that role.

14 Q. Did the Task Force ever recommend that the State adopt EMF exposure
15 guidelines or standards?

16 A. No, the Task Force consistently recommended against the adoption of any
17 such guidelines or standards.¹⁵

18 Q. Did the authors of the CASE Report recommend the adoption of EMF
19 exposure guidelines or standards?

20 A. No, the CASE Report recommended against the adoption of EMF
21 exposure guidelines and standards, and said that there was no rational basis for them.¹⁶

¹⁵ 1992 Report, Request Ex. 3, at 2; 1994 Report, Request Ex. 7, at 2; 1995 Report, Request Ex. 8, at 6;
1998 Report, Request Ex. 9, at 7.

¹⁶ CASE Report, Request, Ex. 4, at 9.

1 Q. In his supplemental testimony, Dr. Bailey describes the development of
2 the concept of “prudent avoidance,” which he explains refers to decisions to avoid or
3 reduce their EMF exposure when that can be done without significant cost or
4 inconvenience. Did the Task Force or the authors of the CASE Report make any
5 recommendations with respect to that concept?

6 A. Yes, both did so.

7 Q. Would you please summarize the treatment of the concept of prudent
8 avoidance in the Task Force and CASE Reports?

9 A. The 1992 Task Force Report recommended against “an active campaign of
10 prudent avoidance,” without a better understanding of whether a hazard existed, or what
11 its sources might be.¹⁷ However, the 1990 “Fact Sheet” that was attached to the 1992
12 Report identified prudent avoidance as something that some individuals might want to
13 engage in, without making a recommendation for or against it, and provided examples of
14 prudent avoidance, such as limiting the use of electric blankets or electrically heated
15 water beds, and moving a motor-driven electric clock away a few feet away from the
16 bedside.¹⁸ The Fact Sheet also suggested that “special” groups such as children or
17 pregnant women may want to be more careful than others.

18 The CASE Report, published in April of 1992, concluded that, in light of its
19 assessment of the scientific evidence, that it would be inappropriate for public authorities
20 to recommend prudent avoidance.¹⁹

21 The 1993 Task Force report, which was developed after a three-day workshop

¹⁷ 1992 Report, Request Ex. 3, at 2.

¹⁸ Request Ex. 1.

¹⁹ CASE Report, Request Ex. 4, at 9.

1 sponsored by the Task Force following its receipt of the CASE Report, considered the
2 “prudent avoidance” concept extensively, and reported that the Task Force had rejected
3 the use of that term in favor of the term “Voluntary Exposure Control.”²⁰ In its
4 discussion, the Task Force described the origin of the term “prudent avoidance” in
5 presentations by Granger Morgan and Indira Nair and the essence of the concept as a
6 recommendation “that we ‘look systematically for strategies which can keep people out
7 of 60-Hz fields arising from all sources but only adopt those which look to be ‘prudent’
8 investments given their cost and our current level of scientific understanding about
9 possible risks.’”²¹ The Task Force then went on to criticize the ambiguity of the term
10 and its potential for misunderstanding, and expressed its preference for the term
11 “Voluntary Exposure Control.”²² Finally, the Task Force recommended that the policy of
12 the State should be to provide information to the public so that they could make
13 individual informed decisions about their EMF exposures.²³

14 The 1994 Task Force Report reiterated the Task Force’s preference for the term
15 “Voluntary Exposure Control ...because it more appropriately describes the nature of the
16 personal choice involved.” At the same time, the report made clear that “the Task Force
17 is not recommending specific Voluntary Exposure Control advice for any population
18 group.”²⁴ The 1995²⁵ and 1998²⁶ reports continued this policy “of making

²⁰ 1993 Report, Request Ex. 5, at 1-5.

²¹ 1994 Report, Request Ex. 7, at 1,2

²² Id.

²³ Id.

²⁴ 1994 Report, Request Ex. 7, at 1.

²⁵ 1995 Report, Request Ex. 8, at 1, 3.

²⁶ 1998 Report, Request Ex. 9, at 7.

1 recommendations for individuals as to means to reduce magnetic field exposures under
2 their control if individuals are concerned about potential health effects.”²⁷

3 Q. Is this policy of providing information about exposure reduction strategies
4 to the public without recommending whether or not they should be implemented also
5 reflected in the 2004 Fact Sheet recently published by the Department of Health?

6 A. Yes.²⁸

7 Q. Has the Task Force ever recommended making changes to the electric
8 transmission system in order to reduce EMF exposure of the public?

9 A. No. The Task Force consistently recommended against making any
10 changes to the electric transmission system.²⁹ However, the Task Force has endorsed the
11 Siting Council’s Best Management Practices as “consistent with” a policy of Voluntary
12 Exposure Control.³⁰

13 Q. When did the Siting Council adopt its Best Management Practices?

14 A. The concept was first identified in October of 1992 by the Task Force in a
15 policy statement submitted to Senator O’Leary, the major sponsor of the legislation
16 creating the Task Force.³¹ The policy was formally adopted by the Siting Council on
17 February 11, 1993.³²

18 Q. Do you agree that the Siting Council’s Best Management Practices
19 are consistent with a policy of Voluntary Exposure Control?

²⁷ Id.

²⁸ 2004 Fact Sheet, Request Ex. 10, at 3: “Although the current scientific evidence provides no definitive answers as to whether EMF exposure can increase health risks, there is enough uncertainty that some people may want to reduce their exposure to EMF.”

²⁹ 1994 Report, Request Ex. 7, at 2; 1995 Report, Request Ex. 8, at 1; 1998 Report, Request Ex. 9, at 1.

³⁰ 1994 Report, Request Ex. 7, at 2, 4; and see 1995 Report, Request Ex. 8, at 1, 5; 1998 Report, Request Ex. 9, at 7.

³¹ 1993 Report, Request Ex. 6, at 1-3, 1-4.

³² 1993 Report, Request Ex. 6, at 1-3; a copy is included as Request Ex. 5.

1 A. Yes.

2 Why are the Siting Council's Best Management Practices consistent with a
3 concept of Voluntary Exposure Control?

4 A. The two concepts were conceived by the Task Force at the same
5 time,³³ and are really two sides of the same coin. In its 1993 Report, the Task
6 Force quoted Dr. Nair, one of the originators of the "prudent avoidance" concept,
7 as submitting that "a decision of 'prudent avoidance' has two tiers: 1) the
8 individual consumer of electricity; and 2) organizations such as power generating
9 utilities."³⁴ However, as the Task Force has consistently recognized, the concept
10 of Voluntary Exposure Control, as articulated by the Task Force, applies only to
11 exposures that are to some extent within an individual's control, such as that from
12 appliances; whereas EMF exposures from newly constructed transmission lines
13 are usually not within an individual's control.³⁵ The Best Management Practices
14 policy was adopted to fill that gap. Just as it may make sense for individuals to
15 take measures that involve no or little cost or inconvenience in order to reduce
16 their personal EMF exposures, in the absence of any scientific justification for
17 doing anything more; it is rational for electric public service companies to incur
18 minimal costs when designing new transmission lines in order to reduce EMF
19 exposures of the public. Field-reduction strategies such as compact spacing and
20 optimum phasing of conductors, which are specified among the Council's Best
21 Management Practices, can often be implemented at such low cost.

³³ See, 1993 Report, Request Ex. 6, at 1-3.

³⁴ 1993 Report, Request Ex. 6, at 1-5.

³⁵ 1994 Report, Request Ex. 7, at 4; 1995 Report, Ex. 8, at 3; 1998 Report, Request Ex. 9, at 6.

1 Q. Do the Council's Best Management Practices specify the
2 undergrounding of transmission lines as a means of reducing EMF exposure?

3 A. No.

4 Q. Did the Interagency Task Force ever recommend undergrounding
5 as an EMF exposure reduction strategy?

6 A. No.

7 Q. Did the authors of the CASE Report recommend the
8 undergrounding of transmission lines as an EMF exposure reduction strategy?

9 A. No.

10 Q. Would requiring transmission lines to be constructed underground
11 be consistent with a policy of voluntary exposure control?

12 A. No, we do not think so.

13 Q. Why not?

14 A. In most cases, the cost of underground construction is a multiple of
15 that of overhead construction; and the undergrounding of transmission lines can
16 also impose inefficiencies and impair the reliability of the transmission system.
17 While no-cost or low-cost choices that will reduce EMF exposure can be justified
18 in the of known risk from such exposure, the same is not true for the very
19 significant costs associated with the undergrounding of high voltage transmission
20 lines.

21 Q. Yet, CL&P, both in the recent 345-kV Bethel-Norwalk project and
22 the proposed 345-kV Middletown-Norwalk project has considered and/or

1 proposed undergrounding portions of the proposed lines. Isn't this inconsistent
2 with your stated policy approach to EMF and that of the CSC?

3 A. No, because the basis for considering or supporting underground
4 transmission was based on other independent factors, including the unavailability
5 of right-of-way of sufficient width, the high density of land use, and visual
6 impacts. The Siting Council statute requires that underground construction be
7 considered for every new transmission line. It has done so since 1972 – when
8 magnetic field health effects were not a matter of widespread public concern.
9 While some types of underground construction may significantly reduce
10 exposures to magnetic fields at residences, this was not the basis for evaluating
11 underground transmission designs. In neither of these projects was underground
12 construction considered as a primary means of minimizing magnetic field
13 exposures. Formatting issues to the end of the document – justification and
14 small “a” for “answer”

15 Q. Are you aware of any scientific developments since 1998 that
16 would call into question any of the conclusions and recommendations of the 1998
17 Task Force Report?

18 A. No. We believe there have been no major interdisciplinary
19 reviews since then that are inconsistent with any of the conclusions expressed in
20 the 1998 Report.

21 Q. Has the Interagency Task Force met since 1998?

22 A. Not that we know of. Certainly, the Advisory Committee has not
23 been asked to do anything.