

PENNSYLVANIA PUBLIC UTILITY COMMISSION
Uniform Cover and Calendar Sheet

1. REPORT DATE: June 4, 1993	:	2. BUREAU AGENDA NO. MAY-93-OSA-113*
3. BUREAU: Office of Special Assistants	:	
4. SECTION(S):	:	5. PUBLIC MEETING DATE June 10, 1993
6. APPROVED BY: Director: C.W. Davis Supervisor:	:	
7. PERSON IN CHARGE: Arnold 7-8032	:	
8. DOCKET NO.: A-110550F0055	:	

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A-110550
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- 9. (a) CAPTION (abbreviate if more than 4 lines)
- (b) Short summary of history & facts, documents & briefs
- (c) Recommendation

(a) Letter Notification of Philadelphia Electric Company relative to reconductoring and rebuilding of the existing 138 Kv line to operate as the Woodbourne-Heaton 230 Kv line in Montgomery and Bucks Counties - Petition of the Office of Trial Staff for Reconsideration of Opinion and Order Entered March 26, 1993; Petition for Permission to File Response ...

(b) On May 11, 1993, the Commission's Office of Trial Staff ("OTS") filed the above Petition seeking reconsideration of the Commission's Opinion and Order entered March 26, 1993. The OTS requests that the Commission extend, indefinitely, the time limit for the remanded proceedings; direct that the burden of proof in the remanded proceedings conform to an application proceeding instead of a letter notification proceeding; and direct that the remanded proceedings address the Commonwealth Court's recent consideration of EMF in an Opinion. The Philadelphia Electric Company ("PECO") filed an Answer to the Petition. The OTS has filed a Petition for Permission to File a Response to PECO's Answer, and a Response to said Answer. PECO has filed a request to respond to the OTS's request to respond to said Answer.

(c) The Office of Special Assistants recommends that the Commission adopt the attached draft Opinion and Order which denies the Petition for Reconsideration.

DOCUMENT
FOLDER

10. MOTION BY: Commissioner Chm. Rolka	Commissioner Quain - Yes
Commissioner Rhodes	Commissioner Hanger - Yes

CONTENT OF MOTION: Staff recommendation adopted.



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17105-3265

June 10, 1993

IN REPLY PLEASE
REFER TO OUR FILE

A-110550
Folder 0055

TO ALL PARTIES

DOCUMENT
FOLDER

Letter Notification of Philadelphia Electric Company relative to
Reconductoring and Rebuilding of the Existing 138 kV Line to Operate
as the Woodbourne-Heaton 230 kV Line

DOCKETED
JUN 21 1993

To Whom It May Concern:

This is to advise you that the Commission at Public Meeting held
June 10, 1993 adopted an Opinion and Order in connection with the above
entitled proceeding.

A copy of the Opinion and Order is enclosed for your records.

Very truly yours,

John G. Alford, Secretary

JZ
Encls.
Certified Mail
Receipt Requested

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17105-3265

Public Meeting held June 10, 1993

DOCKETED
JUN 21 1993

Commissioners Present:

David W. Rolka, Chairman
Joseph Rhodes, Jr., Vice-Chairman
John M. Quain
John Hanger

DOCUMENT
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Letter Notification of Philadelphia
Electric Company Relative to
Reconductoring and Rebuilding of the
Existing 138 kV Line to Operate as the
Woodbourne-Heaton 230 kV Line

Docket No. A-110550F055

OPINION AND ORDER

BY THE COMMISSION:

Before the Commission for consideration is the Petition of the Office Trial Staff ("OTS") for Reconsideration of Opinion and Order Entered March 26, 1993 ("Petition"). Also, we have before us the OTS' Petition for Permission to File Response to Answer of the Philadelphia Electric Company, and Proposed Response filed June 2, 1993 in the above-captioned matter. The Philadelphia Electric Company ("PECO" or "Company"), filed an Answer to the OTS Petition, as well as a Petition for Permission to File an Additional Response and Proposed Response dated June 7, 1993.

Background

The pertinent history of this proceeding has been set forth in our March 26, 1993 Opinion and Order regarding the Initial Decision of Administrative Law Judge ("ALJ") Herbert Smolen. We shall not repeat that history here. By Opinion and Order entered March 26, 1993, we directed a remand to the Office of Administrative Law Judge for further hearings. Specifically, we directed that the remand proceedings include the receipt of evidence and comment regarding all studies of the health effects of eletro-magnetic fields ("EMFs") which are available on or before

the date on which the hearings on that evidence commence; and, in light of findings regarding the health effects of EMFs, what, if any, standards should exist for right-of-way width for the Woodbourne-Heaton 230 kV line.

The Ordering Paragraph which primarily necessitates the OTS Petition is our directive that a supplemental decision concerning these additional studies be issued within 120 days of the entry of the March 26, 1993 Order. The OTS requests that we, first, reconsider the time-limit contained in the March 26, 1993 Opinion and Order.

With respect to our direction that a Supplemental Decision issue within 120 days, the OTS argues that the 120 day period would only allow for 90 days of record development before the presiding officer must begin writing the Supplemental Decision. (Petition, at page 2). According to the position of the OTS, the time limit is patently insufficient for parties to any contested, on-the-record, proceeding before an Administrative Law Judge to identify and retain qualified expert witnesses to testify for credible record development. It then references time schedules in a separate proceeding (Docket No. A-110300F051) wherein the OTS was permitted seven weeks to identify and retain a qualified expert willing to testify concerning EMF.¹

The OTS then details the steps it has taken with regard to the process of contracting to secure approval of an expert witness in the instant matter. The OTS has identified an epidemiologist who would testify regarding the health effects of EMF exposure, and, fortuitously, is available during the time frame set forth for the conduct of this case. The OTS avers that the contracting process, which it has pursued with diligence, will not permit it to secure the services of the expert until several weeks after April 29, 1993, the date which it was informed by the Comptroller of the Public Utility Commission that a contract Addendum which would permit the expert to begin work prior to execution of the contract would not be honored. (Petition, Page 4).

¹ The OTS further suggests difficulty in obtaining qualified expert witnesses because of an alleged, perceived, adverse financial impact.

The OTS also references the procedural date of May 12, 1993, which is the date that the Presiding ALJ in the remanded proceedings has set for the filing of OTS testimony. (Petition, page 5). Under the circumstances, the OTS unequivocally asserts that it cannot file testimony on May 12, 1993. Consequently, the OTS states that it cannot participate in any meaningful way in the instant remand.

The OTS additionally makes the observation that the proceeding at Docket No. A-110300F051² involves the EMF question and its potential health effects, and has been extensively litigated. In that proceeding, the OTS alleges that three witnesses in the area of EMF and related health effects are scheduled to testify. Therefore, the OTS believes that the DQE/GPU proceeding will provide the Commission with an extensive and thorough record which rigorously explores the issues [EMF] involved. We present this quote from the Petition below:

In short, the GPU-DQE case will provide the Commission with an extensive and thorough record which rigorously explores the issues involved. ALJ Smolen originally suggested a moratorium on building high voltage lines until standards could be developed. The Commission apparently has decided to approach the question of standards on a case-by-case basis, rather than by a generic proceeding. It should be obvious that the first case decided will largely dictate what such standards will be. Given that fact, the Commission should not expedite the case at bar with the result that it becomes the landmark Pennsylvania PUC case on EMF's, EMF health effects, and EMF standards.

(Petition, page 6).

² This is a joint application proceeding of Metropolitan Edison Company, Pennsylvania Electric Company, Jersey Central Power and Light Company and Duquesne Light Company to construct a 268 mile transmission line in conjunction with a complex sale of power from the Phillips and Brunot Island generating plants. See Docket No. G-00900240; P-00910502; P-00900485, et al. (Opinion and Order entered April 2, 1992).

The OTS further raises a substantive issue in its Petition. This issue pertains to the burden of proof in the remanded proceedings. The OTS raises, at this juncture, the question of whether the imposition of the burden of going forward with evidence as to whether the Protestants are "aggrieved" as to adverse health effects from EMF, is contrary to the Memorandum Opinion and Order of the Commonwealth Court at No. 761 C.D. 1991, May 24, 1991. The OTS is critical of the presiding ALJ's ruling concerning the burden of proof and the burden of going forward. It characterizes the interpretation of the Commission, in our remand order, and the ALJ, in a July, 1991 Order, as flawed. We reprint the essence of the OTS' position in this regard:

These interpretations, first the Commission's in its remand Order which inspired ALJ Smolen, and then ALJ Smolen's, completely ignored the Commonwealth Court's criticism that proceeding through a letter of notification process in the Woodbourne-Heaton case violated due process and was inappropriate to the due process requirements to be afforded Petitioners. Under this flawed reformulation of the remand, Petitioners in the first remand were required to prove that there were adverse health affects rather than PECO being required to prove (as GPU and DQE must do in A-110300F051 and as PP&L must do in A-110500F0172) that their proposal does not produce adverse health effects. This reformulation continues to affect the current remand in that the ALJ (as evidenced by on the record discussions and rulings during, and the schedule emanating from, the March 31, 1993 telephonic Pre-Hearing Conference) continues to view the case as one in which the public interest parties and the intervenor parties have a burden of proving: (1) whether EMF produces adverse health affects, and (2) whether EMF produces adverse land use effects. (Petition, pp. 10-11).

It concludes the Petition with reference to the fact that the remand proceedings should include consideration of a recent Commonwealth Court decision in re: PECO Taking of Land of Geisler et ux., ("Geisler") No. 2125 C.D. 1988, Opinion and Order dated March 5, 1993. The OTS believes that the Commission should clearly

instruct that the second remand should address and develop the Commonwealth Court's standard that EMF fear and apprehension are proper considerations.

As noted, PECO filed an Answer to the OTS Petition. PECO assails the Petition as untimely. It notes that said Petition was filed two months after the Commission's Public Meeting in which a remand was directed, 46 days after the entry of the remand order, 41 days after the prehearing conference in which the OTS indicated an intent to request enlargement of the 120 day time period, 32 days after ALJ Smolen issued an Order setting forth the schedule for testimony and hearings, and one day before testimony was due. (PECO Answer, p. 3).

In addition to the timeliness, PECO states that granting the relief in the Petition will prejudice other parties to the case. It notes that those parties have revealed their positions, and further, that the orderly presentation of the evidence in the case will be disrupted.

PECO continues to argue that the standards of Duick, et al. v. Pennsylvania Gas and Water Co., 56 Pa. P.U.C. 553 (1982) have not been met. Also, PECO disputes whether the OTS has, in fact, diligently pursued the retention of an expert witness.

PECO follows this argument with the stated position that the testimony of the expert witness identified by the OTS would add little to the proceeding, that further delay would be contrary to the public interest as that interest was expressed by the Commission's preference to move forward with this proceeding. PECO states that the Commission need not wait for a ruling in the DQE/GPU proceeding to develop a record which extensively addresses the EMF issue.

On consideration of the positions of the OTS and PECO, we shall deny the request of the OTS to extend, indefinitely, the time period for our disposition of this proceeding. We disagree that the OTS will not be afforded the opportunity to participate in a meaningful way, in the development of a record in this matter. Further, we must agree with PECO that the OTS' notification of this

Commission of the difficulty in securing the expert witnesses is not timely.³

Concerning the position of the OTS that we should draw a procedural nexus between the DQE/GPU proceeding and the instant proceeding with regard to the EMF issue, we observe that the instant proceeding may, in fact, be as adequate a proceeding for this Commission to have a complete record on which to consider EMF. Contrary to the suggestion of the OTS, we cannot conclude that the DQE/GPU proceedings will result in a superior record concerning what, if any, are the adverse health effects of EMF, and what, if any, should be an appropriate regulatory response.

Also, we determine that the questions pertaining to burden of proof are not properly raised at this stage of the proceedings. The presiding ALJ has ruled on the burden of proof questions and we are not aware of any requests for interlocutory review of said rulings according to our rules of practice and procedure. Accordingly, we shall not consider the arguments concerning the burden of proof at this stage.

Finally, we shall not rule on the merits or relevancy of the Geisler decision in this matter. The parties are free to argue that case in the proceedings on remand; THEREFORE,

IT IS ORDERED:

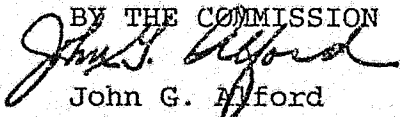
1. That the Petition of the Office Trial Staff ("OTS") for Reconsideration of Opinion and Order Entered March 26, 1993 be and is, hereby, denied.

(SEAL)

ORDER ADOPTED: June 10, 1993

ORDER ENTERED: June 10, 1993

BY THE COMMISSION


John G. Alford
Secretary

³ Our disposition of the OTS Petition does include our consideration of the Petition for Permission to File Response and Response, and the PECO reply.

DATE: June 11, 1993

SUBJECT: Update on Hearing Calendar for Week of June 7, 1993

TO: Aggie Brewster, Supervisor
Docket Section

FROM: Norma Lewis, Supervisor
OALJ Scheduling Unit *ml*

DOCKETED
JUN 21 1993

<u>Docket #</u>	<u>Complainant/Respondent</u>	<u>Hrg. Date</u>	<u>ALJ</u>	<u>Change</u>
R-932548	PUC v. NFG	06/07/93	Schnierle	timechg. to 10AM
A-00108649C9301	PUC v. Hbg. Corporate	06/08/93	Solomon	cancelled/ settled
A-00106583F1AmE	Rick Withelder	06/08/93	Cohen	cancelled
R-932604	PUC v. Dauphin Consol.	06/10/93	Christianson	cancelled
R-932697	PUC v. Columbia Gas	06/10/93	Gesoff	cancelled
"	"	06/11/93	"	cancelled
A-110550F055	PECO/Woodbourne-Heaton	06/07/93	Smolen	cancelled
A-00109052C9101	PUC v. J & S Cab	06/07/93	Kranzel	cancelled
A-00108667C9101	PUC v. I & Y Cab	06/07/93	Kranzel	cancelled
A-00099628F1AmA	MPC Trucking Co., Inc.	06/10/93	Chestnut	cancelled
A-00106098F4	Arl, Inc.	06/07/93	Porterfield	cancelled
C-00924600	PUC V. Diedra Beagle	06/08/93	Corbett	cancelled
F-00202130	Leonard Good v. NFG	06/09/93	Gesoff	cancelled
A-00033216F11AmK	Crossett, Inc.	06/09/93	Corbett	cancelled
A-00108820C9202	PUC v. C&K Well Mgmt.	06/11/93	Porterfield	cancelled/ settled
C-00934648	Shaffer etal v. Comm.Tel.	06/10/93	Lovenwirth	cancelled

WVL

cc: E. Rohrbaugh

**DOCUMENT
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DOCKET NO. A-110550F055
 CASE NAME Letter of Notification of Phila.
Electric Company
 HEARING LOCATION Philadelphia
 HEARING DATE JUNE 14, 1993
 ALJ Smolen

CHECK THOSE BLOCKS WHICH APPLY:
 Hearing held YES NO
 Testimony taken YES NO
 Hearing concluded YES NO
 Further hearing needed YES NO
 Estimated add'l days _____
 RECORD CLOSED YES NO 6/23/93
 Briefs to be filed YES NO 3 initial - 6/16/93
REPLY - 6/23/93
 Date _____
 Date _____

BENCH DECISION _____

REMARKS: _____

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NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
Paul Bonny (Ward Smith) Telephone No. (215) 941-4252	2301 Market St. 523-1 City Philadelphia State PA Zip 19101	Philadelphia Electric Company
Tom Watson Telephone No. ()	1001 Pa. Ave N.W. City Wash State D.C. Zip 20004	Philadelphia Electric Company
Patricia Krise Burket Telephone No. (717) 783-2810	Rm G 30 North Office Bldg. P.O. Box 3265 City Harrisburg State PA Zip 17105-3265	Law Bureau Prosecutory Staff

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Robert J. Stork
 Reporter

APPEARANCE SHEET

ALJ HEARING REPORT

DOCKET NO. A-110550F055

CASE NAME Letter of Notification of Phila.
Electric Co.

HEARING LOCATION Philadelphia

HEARING DATE June 7, 1993

ALJ Smolen

CHECK THOSE BLOCKS WHICH APPLY:

Hearing held YES NO

Testimony taken YES NO

Hearing concluded YES NO

Further hearing needed YES NO

Estimated add'l days _____

RECORD CLOSED YES NO
Date _____

Briefs to be filed YES NO
Date _____

BENCH DECISION YES NO

REMARKS: *Henry Connelly*

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Reporter _____
 COMMONWEALTH REPORTING

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COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17105-3265

IN REPLY PLEASE
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June 15, 1993

John G. Alford
Secretary
Pennsylvania Public Utility
Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

RLS

DOCUMENT
FOLDER

Re: Letter of Notification of Philadelphia
Electric Company Relative to the
Reconstruction and Rebuilding of the
Existing 138 kV Line to Operate as the
Woodbourne-Heaton 230 kV Line in
Montgomery and Bucks Counties,
Docket No. A-110550, F.055

Dear Mr. Alford:

Please find enclosed an original and nine copies of the
Brief of the Law Bureau Prosecutory Staff on Remand in the above-
captioned proceeding. A certificate of service is attached to each
brief.

Respectfully yours,

Patricia Krise Burket
Assistant Counsel

cc: ALJ Herbert Smolen
Parties of record

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PENNSYLVANIA PUBLIC UTILITY COMMISSION
BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

Letter of Notification of
Philadelphia Electric Company
Relative to Reconstruction
and Rebuilding of the Existing
138kV Line to Operate as the
Woodbourne-Heaton 230kV Line in
Montgomery and Bucks Counties.

Docket No.
A-110550
F.055

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BRIEF ON REMAND
OF THE
COMMISSION LAW BUREAU
PROSECUTORY STAFF

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JUN 30 1993

Patricia Krise Burket
Assistant Counsel
Attorney I.D. #47567

Pennsylvania Public Utility Commission
P. O. Box 3265
Room G-30, North Office Building
Harrisburg, PA 17105-3265
(717) 783-2810

DATED: June 15, 1993

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QUESTIONS PRESENTED

1. Whether, at present, there is no conclusive evidence that electromagnetic fields present any hazard to human health?

Suggested answer: YES

2. Whether right-of-way width standards or edge of right-of-way measurement limits should be established for the Philadelphia Electric Company's Woodbourne-Heaton 230kV Line?

Suggested answer: NO

3. Whether the location and design of the Woodbourne-Heaton 230kV Line is consistent with the concept of prudent avoidance so as to justify PECO placing the line into immediate service?

Suggested answer: YES

STATEMENT OF THE CASE ON REMAND

The Law Bureau Prosecutory Staff (Prosecutory Staff) adopts the Statement of the Case presented in its Brief filed in this proceeding on April 20, 1992 (Brief of the Commission Law Bureau Prosecutory Staff, pp. 2-6), but adds the following information to update that statement:

On August 19, 1992, Administrative Law Judge (ALJ) Herbert Smolen issued an Initial Decision in this case wherein he denied in part and sustained in part the protest to the siting application. Specifically, he dismissed the protest in part insofar as it seeks a determination that exposure to electromagnetic fields (EMF) causes adverse health effects. He then sustained the protest insofar as it sought a determination that energization of the Woodbourne-Heaton line at this time will result in adverse land-use impacts by reason of the fear of potential human health effects. In his Initial Decision, ALJ Smolen recommended that the Woodbourne-Heaton Line not be energized pending consideration by the Commission of the adoption and implementation of electromagnetic field standards.

Exceptions were filed by Philadelphia Electric Company (PECO), the Prosecutory Staff, the Commission's Office of Trial Staff (OTS), the Office of Consumer Advocate (OCA) and Pennsylvania Power & Light Company (PP&L). The Protestants,^{1/} OTS, and the other parties to this proceeding filed Replies to Exceptions.

^{1/} Protestants are members of the group PAUSE (Parents Against an Unsafe Environment) and live along the Conrail railroad corridor that contains the PECO right-of-way for the Woodbourne-Heaton line.

On March 26, 1993, the Commission entered an order that remanded the proceeding to the Office of Administrative Law Judge for the purpose of:

- a. receiving evidence and comment regarding all studies of the health effects of magnetic fields which are available on, or before the hearings on that evidence commence; and
- b. determining in light of findings regarding health effects, what, if any, standards should exist for right-of-way width for the Woodbourne-Heaton 230kV line.

Commission Order entered March 26, 1993, at Docket No. A-110550F055, p. 23.

The Commission established a 120-day time during which the ALJ was to issue a supplemental initial decision on these issues. The Commission also gave OTS leave to participate in the proceeding whereas the Office of Trial Staff then entered its appearance in the matter.

On May 27, 28 and June 1, 1993, hearings were held before ALJ Herbert Smolen. Direct testimony was presented by six witnesses on behalf of PECO and one witness on behalf of the OCA. The testimony of two rebuttal witnesses was also offered by PECO. No witnesses were presented by the Prosecutory Staff, PP&L, Protestants, or OTS.

Prior to hearing, a briefing schedule was established which required in-hand exchange of all parties' main briefs on, or before June 16, 1993 and in-hand exchange of all parties' reply briefs on, or before June 23, 1993.

SUMMARY OF TESTIMONY ON REMAND

RONALD J. OEDEMANN -
Direct Testimony on Remand

Ronald J. Oedemann, 2301 Market Street, Philadelphia, PA 19101, the lead project engineer for the Woodbourne-Heaton 230kV line, testified to the design and physical characteristics of the line namely that it is a 12.8 mile 230kV line which electrically connects the Woodbourne Substation to the Heaton Substation (PECO Direct on Remand No. 1, pp. 1-2). Oedemann stated that the line was constructed using 238 existing transmission line structures from an existing de-energized Conrail transmission line (Id., p. 2). The line is designed in the "compact delta" configuration and the "ruling span" or the nominal distance between poles is 300 feet (Id., p. 2). Oedemann then described the Woodbourne-Heaton right-of-way as being a 60-foot right-of-way contained within a wider, existing utility corridor owned by Conrail (Id., p. 2).

The Conrail corridor itself has several existing or recent public utility uses: (1) an active single track Conrail freight rail system which consisted of two railroad tracks until 1991; (2) an electric 132kV transmission line operated by Conrail as part of its bulk power system until 1986; (3) a Conrail power feed and signal communications system; and (4) the Woodbourne-Heaton 230kV transmission line (Id., pp. 2-3). The existing Conrail corridor is approximately 100 feet wide at its narrowest points and approximately 995 feet at its widest points; the average width of the corridor being 310 feet (Id., p. 3).

One side of the PECO right-of-way is coterminous with the edge of the Conrail utility corridor at 12 of the 238 poles (Id.,

p. 3). At points where the edge of the transmission line right-of-way is coterminous with that of the Conrail-owned utility corridor, the adjoining land uses consist of commercial property, an electrical contractor, and land with abandoned vehicles and construction equipment (Id., p. 3). For the remaining 226 poles, the Conrail utility corridor extends beyond the edge of the PECO right-of-way on both sides of the transmission line from approximately 40 feet to approximately 740 feet (Id., p. 3).

Rebuttal Testimony on Remand

In his rebuttal testimony, Oedemann discussed the suggestion raised in the Protestant's May 14, 1993 Statement that the overhead Woodbourne-Heaton 230kV Line be replaced with an underground line (PECO Rebuttal No. 1 on Remand, p. 1). He estimated that taking into consideration costs for materials, basic engineering, installation of the cable and general overhead, placing an underground cable on the Conrail utility corridor to electrically connect the Woodbourne and Heaton Substations would cost a minimum of approximately \$38.5 million, and would take approximately two years to complete after commencement of engineering (Id., p. 1).

Cross-Examination

On cross, Oedemann testified that the 12 poles which he identified as being at locations where the edge of the right-of-way and the edge of the corridor are coterminous are in three distinct locations along the line (N.T. p. 1582). He also testified that the nearest residential property line was about 40 feet from the center of the Woodbourne-Heaton right-of-way and from his recollection of testimony, the nearest residence was 125 feet from the center of the

right-of-way (N.T. p. 1583). He did not know how many different tracts of residential property or undeveloped land zoned for residential use abutted the right-of-way (N.T. p. 1584). Oedemann stated he limited his observations about distance from the right-of-way to the houses owned by Protestants which he viewed from the railroad track (N.T. pp. 1585-1586).

In regard to the \$38.5 million cost of undergrounding a line in the corridor, Oedemann indicated that was minimum and did not include the additional cost of maintenance required for an underground line (N.T. pp. 1586-1587). He testified he did not look at any other corridor in considering the undergrounding of a line to connect the Woodbourne and Heaton substations, just the Conrail corridor, which was the shortest route between the two points (N.T. p. 1587).

For the cost of the hypothetical underground line, Oedemann assumed a three-phase cable in a steel pipe filled with oil (N.T. p. 1587). The cables would be approximately 3 inches apart, a configuration normally used by PECO in connection with 230kV underground installation (N.T. pp. 1587-1588). He testified that the cost of the line between the two substations is approximately \$15.5 million and does not include the cost of legal proceedings (N.T. p. 1588). He did not know what those costs were (N.T. p. 1589).

CHARLES J. BOEGGEMAN -
Direct Testimony on Remand

Charles J. Boeggeman, 2301 Market Street, Philadelphia, PA 19101, testified that he previously addressed the electric and

magnetic fields expected to be produced by the Woodbourne-Heaton transmission line in August 1991 in PECO Direct No. 2 (PECO Direct on Remand No. 2, p. 1). In his testimony on remand, Boeggeman briefly reviewed the characteristics of magnetic fields explaining that magnetic fields, which are measured in milligauss (MG), are created by the flow of electric current through a conductor (Id., pp. 1-2). Factors contributing to the strength of magnetic field associated with a transmission line at any point in time and space include the amount of current flowing through the conductors ("amperage"), the configuration or design of the line and distance from the line (Id., p. 2).

Boeggeman then reviewed existing magnetic field standards (Id., p. 2). He was not aware of any standards other than those adopted in Florida (for 230kV transmission lines, 150MG at the edge of the right-of-way) and the New York interim standard (200MG at the edge of the ROW) (Id., p. 2). He stated that several states had considered whether to enact magnetic field regulations, but none adopted standards that require specific right-of-way widths or edge of right-of-way field levels (Id., p. 2).

Boeggeman testified that the level of magnetic fields for the Woodbourne-Heaton line not only meet, but are well below New York's standard (Id., p. 2). The line's fields expected under normal operating conditions (which will exist 90% of the time) will not exceed 26MG at the edge of the right-of-way (Id., p. 2). Under normal operating conditions, the expected magnetic fields associated with the line at the edge of the wider Conrail utility corridor in

which the PECO right-of-way is located will be in the range of approximately 19MG to well under 0.5MG (Id., p. 3).

Boeggeman then explained that the concept of prudent avoidance is one approach that can be used when considering whether to take steps to limit EMF exposure (Id., p. 3). Prudent avoidance involves limiting exposures when this can be done with small, or modest investments of money or effort (Id., p. 3). He further explained that prudent avoidance should be evaluated according to the facts of each particular situation (Id., p. 3).

Boeggeman asserted that the compact delta configuration of the line, the projected amperage load and the right-of-way width, has resulted in magnetic field levels for the Woodbourne-Heaton 230kV Line that are far below existing standards (Id., p. 3). In addition, the location of the line right-of-way within the wider, existing Conrail-owned utility corridor resulted in the fields at the edge of the utility corridor that are even lower and in some cases, substantially lower than at the edge of the transmission line right-of-way (Id., p. 4). Boeggeman concluded that the existing right-of-way is consistent with the concept of prudent avoidance as the low fields from the line were achieved at modest or no cost (Id., p. 4).

Rebuttal Testimony on Remand

Boeggeman testified in regard to OCA's witness David Janes' discussion in OCA Statement No. 1B on ways that prudent avoidance could be incorporated into a similarity-based standard (PECO Rebuttal on Remand No. 2, p. 1). Boeggeman believed that the majority of the measures described by Janes such as continued "research into the effects of electric and magnetic fields" and "informing the public"

while worth consideration are unrelated to whether the Commission should set right-of-way width standards for the Woodbourne-Heaton 230kV line and to any process for setting right-of-way width standards for this line (Id., p. 1).

Boeggeman stated that the only factor mentioned by Janes that was related to the question of setting right-of-way width standards was his suggestion that the Commission may wish to consider using a process in which the "similarity" basis for the standard is set using "only newer transmission line designs that minimize electric and magnetic fields" (Id., p. 2). Boeggeman asserted that the Woodbourne-Heaton line uses a "newer transmission line design" that minimizes electric and magnetic fields, the compact delta configuration, which allows it to meet all existing magnetic field standards (Id., p. 3).

Boeggeman then commented on the Protestants' position that PECO should purchase all properties "any portion of which would be within levels above one milligauss more than 5% of the time" (Id., p. 3). Cross referencing his August 1991 direct testimony, and exhibits (PECO Direct No. 2 and PECO Exhibit No. 2), he explained that the specified magnetic field levels would exist out to approximately 230-250 feet on either side of the transmission line (PECO Rebuttal on Remand No. 2, p. 3). He also testified that the purchase of these properties would not be consistent with the concept of prudent avoidance for two reasons (Id., pp. 3-4). First, the researchers at Carnegie Mellon University, who formulated the concept of prudent avoidance, stated that moving to get away from a transmission line went beyond prudence and that was what the

Protestants' proposal was meant to do -- to allow them (the Protestants) to move away from the line (Id., pp. 3-4). Second, the concept of prudent avoidance suggests considering actions which can be undertaken with "small or modest" investments of effort and money, and referencing the rebuttal testimony on remand of Ronald Oedemann, the cost of purchasing the Protestants' properties would be over \$160 million (Id., p. 4).

Boeggeman then indicated that the additional cost of undergrounding the Woodbourne-Heaton 230kV line would be approximately \$38.5 million at minimum (Id., p. 4). He did not believe that this was a small investment that was consistent with the concept of prudent avoidance (Id., p. 4).

Cross-Examination

On cross, Boeggeman testified that the New York 200 milligauss edge of right-of-way standard was calculated on maximum winter normal conductor rating from a survey of existing 345kV transmission lines (N.T. p. 1551). Subject to check, Boeggeman accepted that the New York 345kV lines operated at their winter normal conductor rating 0.1 percent of the time and that 99% of the time the magnetic field at the edge of the right-of-way was less than 55 milligauss (N.T. p. 1552).

Boeggeman indicated his calculations on Table 2 of PECO Exhibit No. 2 in regard to magnetic field levels for the Woodbourne-Heaton line operating under various loading conditions were not based on winter normal conductor ratings (N.T. p. 1553). To convert the figures in column five of the table, he would multiply the number relating to loading in thousand amps by 1.8 (N.T. pp. 1554-1555).

Boeggeman also testified that the New York standard for 345kV lines was applicable to 230kV lines (N.T. pp. 1554-1559).

As to the modest cost of measures related to prudent avoidance, PECO stipulated that Boeggeman did not do the cost calculations, but accepted the calculations of its witness Ronald Oedemann (N.T. pp. 1564-1571). Boeggeman also testified he did not consider the resale value of the Protestants' properties (if they were purchased by PECO as had been proposed by Protestants) in his determinations about prudent avoidance (N.T. pp. 1571-1574).

Redirect

On redirect, Boeggeman read portions of the document on "New York Interim Magnetic Field Standards" into the record to support his contention that the standard is applicable to 230kV transmission lines (N.T. pp. 1576-1577).

Boeggeman also testified that there are physical constraints at the Woodbourne and Heaton substations that limit loading on this line to 1000 amperes maximum for emergencies (N.T. pp. 1577-1578). He confirmed that even if the winter conductor rating was used for this line the line still met the New York standards for magnetic fields (N.T. p. 1578).

DONALD S. FRIEMAN -
Rebuttal Testimony on Remand

Donald S. Frieman, 2301 Market Street, Philadelphia, PA 19101, who had not previously testified in this proceeding, testified in rebuttal to Protestants' suggestion in their May 14, 1993 Statement of Position that the Company should purchase all properties any portion of which could be within levels of one milligauss more

than 5% of the time (PECO Rebuttal on Remand No. 3, p. 1). Frieman has been with PECO in the real estate department for 40 years and is the Manager of the Real Estate Department of Philadelphia Electric Company (Id., p. 1). His duties include the administration of all real estate needs within the corporation and the preparation of budgets, project estimates, route and property studies (Id., p. 1). He explained he also directs the evaluation of real property values and negotiations with private and public owners for among other things, the acquisition, sale, lease, of real property (Id., p. 1).

In regard to the Protestants' proposal, Frieman stated that using Mr. Boeggeman's testimony that the specified field levels would exist out to approximately 250 feet on either side of the transmission line, he used tax maps^{2/} to locate all parcels that were includable in the Protestants' proposal (Id., p. 2). From county records, Frieman determined the assessed value for the properties, as well as the accepted ratio in each county of assessed value to market value ("common level ratio") (Id., p. 2). Using these methods, Frieman calculated that approximate market value of the properties includable in the Protestants' proposal would be over \$160 million (Id., p. 2).

Frieman stated that PECO would not be able to exercise eminent domain for the portion of the property that is residential and consequently, refusal of any residential landowner to sell his property would prevent the use of the line (Id., p. 2). A change in legislation would be required to permit the taking of homes by

^{2/} Initially, Frieman corrected his testimony on remand at p. 2, line 3, substituting "tax maps" for "aerial photographs" (N.T. p. 1590).

utilities through the exercise of eminent domain to comply with this condition (Id., p. 2).

Cross-Examination

On cross-examination, Frieman stated that he didn't specifically focus on residential property in answering the Protestants' suggestion that the Company purchase all property, any portion of which would be within levels of one milligauss more than 5% of the time, but that there were 314 parcels which included residential through industrial, commercial and institutional (N.T. pp. 1592-1593). He indicated the tax maps that he used did not indicate zoning and that he did not know how many of the properties were owned by Protestants (N.T. p. 1593). He also did not know what portion of the \$160 million would consist of the fair market value of the Protestants' properties in this case (N.T. p. 1593).

Frieman indicated that the \$160 million was a minimal value because there were other factors he needed to take into account including: 1) the fact that the acquisition of houses in an area changes the supply and demand in the area and can raise value in the community; 2) the cost of condemnation involving legal expense and preparation of real estate appraisal for court action; and 3) relocation expenses (N.T. pp. 1595-96). He stated there were no factors that would bring the cost of property acquisition down (N.T. p. 1596).

When questioned about the company owning these properties, he stated that the real estate would be an asset, but there would be other costs involved, such as the demolition of improvements (N.T. p. 1597). He also stated that reuse of vacant land in the corridor

would be minimal as the purpose of buying the corridor is to keep it clear for utility use (N.T. pp. 1597-1599). He also stated that if the use changed to a utility corridor devoid of other uses, the value would drop tremendously (N.T. p. 1600).

When questioned about a statement by PECO witness Van Dyke (PECO Rebuttal Statement No. 5, p. 12) that energization of the line will have no impact on property value, Frieman agreed, but stated if PECO was ordered to buy the property within certain limits, land use would change to a utility corridor and the property values would initially drop because of removal of improvements and then would recycle and maybe go higher if other uses evolved (N.T. pp. 1599-1605). He also stated that the cost to carry property, if it is utility property and is in the rate base, would be 16% (N.T. p. 1606). Considering the undeveloped land that they would buy and the present real estate market, he stated the costs of carrying the property would be catastrophic to the company (N.T. p. 1606).

Frieman then testified he did not make any effort to ascertain the aggregate market value of the Protestants' properties, nor the market value of properties needed to be acquired if the test were any other test than one milligauss 5% of the time (N.T. p. 1607). He also did not make any effort to value property for reuses that would not entail residences, including every allowable use other than residences for children and schools (N.T. p. 1607).

DAVID E. JANES -
Direct Testimony on Remand

David E. Janes, Vice President of Risk Analysis
Corporation, Suite 202, 6723 Whittier Avenue, McLean, VA 22101,

discussed policies various states have used to address the possibility that exposure to power frequency electric and magnetic fields may adversely affect human health (OCA Statement No. 1B, pp. 1-2). Janes has over thirty years of experience in analyzing the effects and risks of exposure to ionizing radiation and electromagnetic fields (Id., p. 1).

Janes testified as he had in his previous testimony that weak electric and magnetic fields can affect cellular and animal systems, but noted that the weak field effects observed in animals are subtle and often transient or reversible (Id., p. 2). He concluded that the connection between these effects and any harm to human health is unclear and indicated his conclusion presented in his 1991 testimony remains valid, and supported by three extensive reviews of literature which had been undertaken since that time (Id., p. 2, p. 18, References 2, 3 & 4).

Referencing the direct testimony of David Rosenbaum, OCA Statement No. 2, which summarized the current state of the knowledge of the effects of power frequency fields on people, Janes testified that he agreed with Dr. Rosenbaum that the epidemiological studies are confusing and it is not even clear if exposure to power lines does increase the risk of cancer, it is the average magnetic field that is the cause (Id., p. 3).

Janes believed the four recent epidemiological studies -- two case control studies in Sweden, a case control study in Denmark and a cohort and case control study of electric utility workers in the United States -- did not resolve the confusion about whether exposure to power frequency magnetic fields affects human health

(Id., pp. 3-4, p. 18, Reference 6-9). The Swedish occupational study reports a positive association between exposure to magnetic fields and the incidence of chronic lymphocytic leukemia while in the Swedish residential study, the association appears to be negative (Id., p. 4, p. 18, References 6 & 7). Janes explained that the results of the Swedish residential study of an association between magnetic field exposure and childhood leukemia, but no association for brain tumors, are at variance with the earlier Swedish study by Tomenius (Id., p. 4, p. 18, References 6 & 10). Tomenius saw only three-tenths of the expected number of cases of leukemia in those more highly exposed to magnetic fields and an increase in the incidence of brain tumors and benign childhood tumors among those with higher field readings and those nearer power lines (Id., p. 4, p. 18, Reference 10). Janes stated that the most troublesome result of the Swedish residential study was the association between childhood leukemia and magnetic field exposure, but cautioned that associations in one study may not be found in subsequent studies (Id., p. 4).

In regard to experimental studies Janes testified that at this time, biophysical mechanisms of how weak fields might interact with biological systems to produce harm have not been demonstrated experimentally (Id., p. 5). Without a viable biophysical mechanism to connect them, the results of epidemiological, animal and cellular level studies alone are not strong enough to establish a causal link between exposure to power frequency fields and harmful effects (Id., p. 5). Janes then testified that experimental evidence makes the

hypothesis of harmful effects plausible and the possibility of harm could not be summarily dismissed (Id., p. 5).

Janes then discussed policy alternatives that other state regulators have to control exposure to power frequency fields from transmission lines (Id., p. 5). He specifically discussed five policy alternatives developed by Dr. Granger Morgan at the Department of Engineering and Public Policy at Carnegie Mellon University in a paper prepared for the U.S. Congress Office of Technology Assessment (Morgan's OTA Report):

1. Do nothing until the science becomes better.
2. Make public information available, but take no further action.
3. Adopt a field strength safety approach to transmission line fields based on the fiction that the numbers are supported by a review of the science . . .
4. Adopt a "similarity" based approach to transmission line fields which makes the exposures that people receive to these fields "similar" to those they receive from other sources in modern life . . .
5. Adopt a "prudent avoidance" strategy. That is look systematically for strategies which can keep people out of 60 Hz fields arising from all sources but only adopt those which look to be "prudent" investments given their cost and our current level of scientific understanding about possible risks.

OCA Statement No. 1B, p. 6, p. 18, Reference 11.

Janes testified that some states have set standards for power frequency electric and magnetic fields on or at the edge of the right-of-way (Id., p. 7). Other states have decided that the standards are not warranted at this time and have active programs for monitoring and evaluating the results of the research (Id., p. 7). Others have explicitly or implicitly adopted a "prudent avoidance" approach (Id., p. 7).

Seven states have adopted standards for electric field strength on or at the edge of the right-of-way (Id., p. 7). Florida and New York have adopted standards that regulate magnetic fields at the edge of right-of-way but neither represent these standards as being "health based" standards (Id., p. 7, p. 18, Reference 12). Janes states that these standards are more logically consistent with the "similarity" based approach (Id., pp. 7-8). Table 1 at p. 9 of OCA Statement No. 1B lists the states which have adopted field level standards.

Janes indicated that a health based standard for power frequency electric and magnetic fields cannot be developed at this time because the uncertainties are too great (Id., p. 11). He indicated that there were two additional problems: not knowing what aspect of exposure to control nor the shape of the response function (Id., pp. 11-12).

On similarity standards, Janes quoted passages from Morgan's OTA report to explain that

[s]imilarity based control sets out to make people's exposure to transmission line fields as "similar" as possible to the exposures we receive from all other fields in our day-to-day lives.

OCA Statement No. 1B, p. 12, p. 19, Reference 12.

Janes also quoted Morgan's OTA Report to justify similarity based approach on two grounds: (1) acceptability and (2) equity (Id., p. 12). By making transmission exposures similar, they are made socially acceptable (Id., p. 12). If transmission line fields are made similar to fields to which everyone is exposed from other sources, then asking people living near transmission lines to bear similar burdens is not inequitable (Id., p. 13).

Janes testified that the electric and magnetic fields produced by the Woodbourne-Heaton 230kV line do not exceed New York and Florida standards (Id., pp. 13-14). As the maximum values of the magnetic field depend on line loading, if the line operates 90% at "light" and "normal" loads, 0.05% (4 hours) at "emergency maximum" and the remaining time at heavy load, then the maximum annual average fields on the right-of-way and at the edge of the right-of-way should not exceed 45 and 27 milligauss, respectively (Id., p. 13). Under "emergency maximum" operating conditions the maximum fields on the right-of-way and at the edge of the right-of-way are 120 and 70 milligauss, respectively (Id., pp. 12-13).

Janes testified that if a health based standard could not be developed at this time, then similarity and prudence concepts could be incorporated by Pennsylvania into the regulatory process (Id., p. 14). He suggested that a study be done to determine the maximum electric and magnetic fields at the edge of the right-of-way for a representative sample of 230 kV transmission lines, not necessarily only those in Pennsylvania (Id., p. 14). From the results of the study, values of electric and magnetic field strengths could be selected [as standards] that would be typical or similar to values elsewhere in the state (Id., p. 14). Prudence could be incorporated into the process of developing a similarity based standard by using only newer transmission line designs that minimize electric and magnetic fields (Id., p. 15).

Janes also suggested that in new applications, the Commission could require utilities to document the electric and magnetic fields produced by each of the alternative designs they

considered as well as the actions actively taken by the utility to reduce electric and magnetic fields and the attendant costs (Id., p. 15). He reiterated other prudence measures addressed by Dr. Rosenbaum in earlier testimony: 1) research into the effects of electric and magnetic fields should be continued; 2) the government and the industry should be aggressive in periodically informing the public in an impartial manner about the latest information about EMF; 3) the public should be involved in the decision making process; 4) companies contemplating power line projects should consider the cost and effects of possible mitigative measures in planning; 5) mitigative measures that should be considered include, inter alia, avoiding heavily populated areas, avoiding parks, schools and other public facilities, widening rights-of-way, limiting public uses of rights-of-way, using higher ground clearances, and designing the power lines to reduce the fields; and 6) in planning, one should err on the side of safety, but not without considering the cost (Id., p. 16).

Janes then gave a qualified recommendation for how the Commission might set a numerical standard for electric and magnetic fields at the edge of right-of-way for the Woodbourne-Heaton 230kV line (Id., p. 16). He suggested that the standard set should be an interim standard, and made with the recognition that the standard is not based on avoidance of health effects (Id., p. 16). Specifically, Janes recommended that the Commission as an interim measure, could adopt a similarity and prudence based standard for the Woodbourne-Heaton 230kV lines using lines of modern design as a basis, not necessarily just those in Pennsylvania (Id., p. 17).

Cross-Examination

On cross, Janes testified that from his reading of epidemiological literature, the most consistent observation is an association between exposure to magnetic fields and the incidence of leukemia (N.T. p. 1612). He believed the issue needed further investigation because it was troublesome to him (N.T. pp. 1612-1613). He mentioned he reviewed the Danish study but noted that it was an unpublished preliminary report from which he could draw no conclusions (N.T. p. 1613).

In his testimony, Janes reiterated that a health based standard cannot be established at this time (N.T. p. 1614). He agreed that, hypothetically, prudent avoidance would entail avoiding the construction of new lines and consequent exposure if the lines were not needed (N.T. p. 1617). He agreed that in the interim period before a field limit standard is set, he would want some understanding of what the benefit of the line would be (N.T. p. 1618).

When questioned whether Janes would set a magnetic field level for this line at less than one milligauss, he doubted if it would be that low, but didn't know (N.T. p. 1619). He would not agree that the standard would be substantially greater than one milligauss (N.T. p. 1619).

When questioned about the conclusion of the report prepared by the Oak Ridge Associated Universities (ORAU) for the Committee on Inter-Agency Radiation Research and Policy Coordination, Janes agreed that the report indicates that there is no convincing evidence in the published literature to support the contention that exposures to

extremely low-frequency electric and magnetic fields generated by sources such as household appliances, video display terminals and local power lines are demonstrable health hazards (N.T. pp. 1625-1626). He believed the statement from the report was consistent with his position (N.T. p. 1626).

Janes then testified, reading his prepared answer to an interrogatory promulgated by PECO, that he did not believe that the Commission should set a right-of-way standard for magnetic fields for the Woodbourne-Heaton 230kV line (N.T. p. 1627).

RICHARD S. BOCKMAN -

• Direct Testimony on Remand

Dr. Richard S. Bockman, 520 East 72nd Street, Apartment Lobby S, New York, NY, testified previously in this proceeding on electromagnetic field studies related to the endocrine system and the immune system (PECO Direct No. 3 on Remand, p. 1). Dr. Bockman is a medical doctor, a researcher and a teacher in the fields of endocrinology and immunology (Id., p. 1).

Bockman described newer studies done in two areas of research involving the neuroendocrine system: magnetic field perception and calcium metabolism (Id., p. 1). The witness concluded that with respect to magnetic fields, there remains no evidence to date to indicate that humans can perceive power frequency magnetic fields at levels associated with or far exceeding those from transmission lines (Lovely et al., 1992) (Id., p. 2). The witness also concluded that the studies he reviewed on EMF and calcium metabolism (Parkinson & Sulik, 1992 and Prasad et al., 1991) were consistent with his previous conclusion that 60 Hz electric and/or

magnetic fields do not modulate cell function or endocrine system function by altering calcium metabolism (Id., p. 2).

Bockman then reviewed the Soriano et al. 1992 study involving EMF and the circadian rhythm of the hormone melatonin (Id., pp. 2-3). The study showed a decrease in the number of synaptic ribbons (a neuroanatomical correlate of melatonin rhythms) in rats after 15 and 21 days of exposure of 52,000 milligauss (Id., p. 3). Bockman discounted this research as it involved fields many times higher than those associated with a transmission line (Id., p. 3). His conclusion was that the rat melatonin studies do not provide a basis for concluding that power frequency fields lead to adverse effects on human biologic rhythms (Id., p. 3).

Bockman then commented on EMF studies related to reproduction and development (Id., p. 3). Such studies using chick embryos exposed to 60 Hz sinusoidal fields show no significant difference between the exposed and the control groups in fetal malformations (Martin, 1992) or temporal aspects of development (Koch & Koch, 1991) (Id., p. 3). Also Bockman commented on an epidemiological study that found no association between use of electric bed heating and congenital effects (Dlugosz et al., 1992) (Id., p. 3). These additional negative studies were consistent with those described in his previous testimony (Id., p. 3).

Bockman then reviewed recent immunologic studies exposing isolated human lymphocytes to magnetic fields and/or plant lectins (Prasad et al., 1991; Persson et al., 1991; and Yost & Liburdy, 1992) (Id., p. 4). The results of these studies have been mixed and the witness indicated that there is no clear biologic relevance of these

studies using unusual plant lectins on naked cells (Id., p. 4). The witness then testified that whole animal research provides a more accurate reflection of the functional integrity of the immune system, and cited the 1991 McLean et al. study that showed that a 20,000 milligauss 60 Hz magnetic field had no effect on the host immune response when natural killer cell activity was followed (Id., p. 4).

Bockman expressed his familiarity with recent reviews of EMF research, specifically ones produced by the Electro-Magnetic Health Effects Committee for the Texas Public Utility Commission (Id., p. 5). He agreed with the Committee's conclusion that:

research presented to date appears to reject the hypothesis that acute or prolonged exposure to EMF equivalent or several times stronger than fields experienced under high voltage AC lines results in biologic disruption of endocrine or immune systems.

PECO Remand on Direct No. 3, p. 5.

Bockman then stated his opinion that power frequency electric and/or magnetic fields several times stronger than those experienced under transmission lines do not disrupt the endocrine or immune systems (Id., p. 5). He continued that he saw no reason to establish magnetic field right-of-way standards from the endocrine or immune sciences (Id., p. 5).

Cross-Examination

On cross, Bockman confirmed that the diatom mobility study which Parkinson and Sulik attempted to replicate unsuccessfully had been conducted by Smith and Liboff among others at Montana State University (N.T. p. 1539). After being reminded of a study conducted by Batelle Pacific Northwest Laboratories which produced positive

results at 16 hertz, Bockman agreed that the results of studies on the effects of magnetic fields on diatom mobility have been mixed, but stated that he didn't believe studies of small calcium-containing organisms in the presence of non-power frequency fields had much biological relevance (N.T. p. 1540-1542).

To a question seeking explanation of diatom mobility, Bockman first reviewed Dr. Liboff's ion resonance theory which allegedly explains calcium ion movement (N.T. p. 1543). He then explained that the diatom system, which probably couldn't be farther away from humans, involves small organisms which contain a lot of calcium whose changes in mobility is measured as they move through agar, a thick jello-like substance, under the influence of what are non-power frequency fields (N.T. p. 1544).

In regard to the specific paper on diatom movement, Bockman stated the researchers said they did have an effect at 16 Hz, but that the movement observed was sufficiently random that they could not say that there really was significant movement (N.T. p. 1545). Bockman believed that negated the entire study (N.T. pp. 1545-1546).

Referring to studies cited previously in his testimony which looked directly at calcium movement in cells (patch-clamp technique used by Hojevik, et al.), Bockman concluded that these studies do not show changes in calcium in the presence of electric and magnetic fields (N.T. p. 1546).

PHILIP COLE -
Direct Testimony on Remand

Dr. Philip Cole, a professor and researcher in epidemiology and a medical doctor, testified that his business address was the

Department of Epidemiology, School of Public Health, University of Alabama, Room 203, Tidwell Hall, University Station, Birmingham, AL 35294 (PECO Direct on Remand No. 4, p. 1). He explained that he had previously testified in this proceeding on epidemiological research concerning power frequency electric and/or magnetic fields (Id., p. 1). The purpose of his additional testimony was to identify and analyze the more recent epidemiological studies involving magnetic fields (Id., p. 1).

The first of the studies Cole reviewed involved EMF and childhood cancer, the most important of which was the recent residential study conducted in Sweden by Feychting and Ahlbom (1992). Cole explained that the Swedish researchers had access to data on past loading (amperage) and were able to calculate the average annual magnetic field that would have been associated with that loading (Id., p. 2). From this information the researchers estimated for each residence in the study, the average annual strength of the magnetic field that the transmission line would have created in that residence (Id., p. 2). Most of the estimates used in the study deal with the average annual magnetic field associated with the transmission line in the year immediately prior to a child's diagnosis with cancer (Id., p. 2). For some residences, spot measurements were also made (Id., p. 3).

The Swedish researchers calculated that if children who lived in the corridor had cancer at the same rate as the general childhood cancer in Sweden, there would be 138 cases expected in children living in the transmission line corridor; the researchers found 142 cases of childhood cancer (Id., p. 3). Cole concluded that

this fact made the Swedish study a negative or a null study, i.e., that residence near high voltage lines is not associated with increased risk of cancer in children (Id., p. 3).

Cole testified that the above information was not in the original publication of the study which did not appear in a peer-reviewed journal (Id., p. 3). The researchers released the information in response to inquiries from members of the scientific community (Id., p. 3). Cole stated that the data indicated that there were no differences between cases and controls or that cancer risk decreases with higher exposures for all childhood cancers and childhood brain cancers, whether exposure is estimated using calculated fields or with actual magnetic field measurements (Id., p. 4). He also testified that the study is weakly positive for childhood leukemia (Id., p. 4).

Specifically on childhood leukemia, he commented that the study was small -- only 38 cases in a study base of all children who ever lived in the transmission line corridor from 1960 to 1985 (Id., p. 4). Moreover, children who lived in the corridor for the largest percentage of their life have the smallest risk of cancer (Id., p. 4). For those children who lived in the corridor from birth to diagnosis, residence in a higher field home was associated with no increase in cancer risk (Id., p. 4).

Cole also cited inconsistent results from the Swedish study in that the positive association of leukemia was true for single family houses but not apartments and it did not exist for children who were diagnosed with cancer from 1960 to 1974 (Id., p. 4). A true cause of cancer would cause cancer in both types of residences and

during all time periods under study (Id., p. 4). Finally, there is no association between childhood leukemia and actual magnetic field measurements in the Swedish study (Id., p. 4). The data on measured magnetic fields are actually inverse as they show a lower incidence of cancer in children who resided in homes with higher field measurements (Id., p. 4).

In conclusion Cole believed the Swedish study is negative for all cancers and brain cancers and that it is weakly positive for leukemia (Id., p. 5). He also stated because of the inconsistencies in the childhood leukemia data, the data could support a null or negative interpretation as easily as a positive one (Id., p. 5).

Cole testified that he agreed with the conclusions of United Kingdom's National Radiological Protection Board ("NRPB") who in 1992 released an extensive review of the EMF epidemiology and concluded that the epidemiological findings reviewed provide no firm evidence of the existence of a carcinogenic hazard from exposure of paternal gonads, the fetus, children or adults to extremely low frequency EMF that might be associated with residence near major sources of electricity supply, the use of electrical appliances or work in the electrical, electronics and telecommunications industry (Id., p. 5). He also agreed with the NRPB's addendum to their report which was released in March 1993 in which they conclude that recent residential studies including the Swedish residential study do not establish that exposure to EMF is a cause of cancer (Id., pp. 5-6). Cole also agreed with the report's statement that epidemiological studies do not provide an effective basis for quantitative restrictions on exposure to electromagnetic fields (Id., pp. 5-6).

Cole agreed with the conclusions of the scientific review undertaken by the Oak Ridge Associated Universities ("ORAU"), a private, not-for-profit consortium of 62 universities (Id., p. 6). ORAU concluded that the available literature does not support a causal inference that EMF has a carcinogenic effect (Id., p. 6). In a separate report, ORAU reviewed the Swedish study which had not previously been available and concluded that the evidence reported in the study was not sufficiently compelling to alter the conclusions of the ORAU report (Id., p. 6).

Cole then discussed the Danish residential case-control study of childhood cancer conducted by Olsen et al. (Id., p. 7). In a preliminary report of partial results, the authors reported that in the Danish study population, living in a home near high voltage electric facility is not associated with increased risk of childhood leukemia or childhood brain tumors (Id., p. 7). The authors did report an increased risk of childhood lymphoma based on three cases (Id., p. 7). Cole gave little weight to this study since the reported data was both partial and preliminary (Id., p. 7).

Taking the research on childhood cancer as a whole, Cole concluded that there is no demonstrated increased risk of childhood cancer when actual electric and magnetic fields are measured (Id., p. 7). When surrogates such as wiring code or estimated fields are used in childhood studies, the data shows a pattern of mixed results between weak positive and negative outcomes (Id., p. 7). As a whole, he concluded that the epidemiologic evidence on EMF provides no persuasive scientific support for the hypothesis that EMF causes cancer in children (Id., p. 7).

Cole then discussed occupational and residential studies involving EMF exposure and adult cancer (Id., p. 8). He indicated that the recent research on adult cancers did not introduce significant changes in study design or method from previous research in this area (Id., p. 8).

Cole testified that the previously discussed Swedish residential study by Feychting and Ahlbom (1992) is uniformly null or negative for both measured fields and calculated fields, for all forms of adult brain cancer and for all forms of adult leukemia except chronic myeloid leukemia, which shows a small increase for calculated fields (Id., p. 8).

Cole also testified that a residential study in the Netherlands (Schreiber et al., 1993) which used the retrospective follow-up method is negative, showing no association between residence near transmission facilities and cancer risk (Id., p. 8). A case-control study from Poland (Gajewski et al., 1989) showed the residential data from the study to be negative, but non-persuasive, due to limitations in the study (Id., p. 8).

As to four recent occupational case-control studies, Cole identified three as being positive and one as being negative (Id., pp. 8-9). Cole stated that none provides a significant improvement in method or design and did not believe they add substantially to our knowledge (Id., p. 9). Another study, a retrospective follow-up study from Denmark (Guenel et al., 1992), showed preliminary results which are negative or null for breast cancer, melanoma, and brain cancer in both men and women and weakly positive for men for leukemia and negative for women for leukemia (Id., p. 9).

Cole then discussed the occupational study conducted by Sahl et al., which he stated represented a substantial improvement over all previous occupational studies (Id., p. 9). The Sahl study used a main approach to exposure assessment, actual measurements of magnetic fields in the workplace, rather than a peripheral approach such as use of job titles to categorize exposure (Id., p. 9). Workers were equipped with meters to record their magnetic field exposure during the full work shift and this information was used to characterize magnetic field exposure in the jobs evaluated in the study (Id., p. 9). He found this to be a much more reliable method than utilizing job titles to estimate EMF exposure (Id., p. 9).

Cole explained that the Sahl study consists of four separate investigations: a cohort (retrospective follow-up) study and three case-control studies (Id., p. 10). Cole remarked that the size of the study was quite large: cancer deaths among more than 36,000 utility workers were examined from the period 1960-88 (Id., p. 10). During that period, more than 3,000 utility workers died, including more than 700 who died from cancer (Id., p. 10).

Cole discussed the thoroughness of the Sahl study as being impressive as it considered a number of different measures of workplace magnetic field exposure including (1) mean; (2) median; (3) 99th percentile; (4) fraction exceeding 10 MG; and (5) fraction exceeding 50 MG (Id., p. 10). In his study, Sahl had examined associations of each of these measures with leukemia, brain cancers and lymphoma (Id., p. 10). Also Sahl had evaluated a number of possible "latency period" assumptions by considering exposure windows

of 10 and 20 years in combination with assumed latency periods of 2 and 5 years (Id., p. 10).

Cole then discussed the results of the Sahl study which he described as consistently negative (Id., p. 10). No consistent association was found between any measure of workplace magnetic field exposure and leukemia, brain cancer or lymphoma risk -- even among workers who had significantly higher exposures to magnetic fields (Id., pp. 10-11). Additionally, the study showed no evidence of a dose-response relationship and there was no indication that the negative results of the study were significantly influenced by confounding or other factors (Id., p. 11).

Cole's overall conclusion in regard to adult cancer studies was that the studies show weakly positive to zero to inverse associations and that the studies that use the most acceptable design consistently have found no association between EMF and cancer (Id., p. 11). Overall, he concluded that the studies he reviewed do not support the hypothesis that EMF is associated with adult cancer, and that the best designed and conducted studies provide strong support against the hypothesis that EMF is associated with adult cancer (Id., p. 11). The bottom line of Cole's testimony is that there is no demonstrated relationship between EMF and cancer in human beings (Id., p. 11). He also testified that he believed that the Woodbourne-Heaton 230kV line poses no threat of cancer to persons in the vicinity and that epidemiologic research thus provides no reason to set any standards related to this line (Id., p. 12).

Cross-Examination

On cross-examination, Cole was questioned about the Swedish residential study conducted by Feychting and Ahlbom (N.T. pp. 1635-1646). He indicated that the Swedish study used three types of measurement: calculated historic fields; distance from power line and contemporary spot measurement (N.T. p. 1637). He stated that historic calculated field is new to EMF residential studies; he indicated that the measure is more detailed, but may not be the most accurate (N.T. p. 1637). He explained that the sample for the study selected included those people who lived within 300 meters of transmission lines of a certain size within Sweden during a certain period and had to be in the Swedish population register (N.T. p. 1538). He agreed that the selection procedure was an accepted way to minimize bias (N.T. p. 1639). In examining data tables from the study, Cole indicated that 0.1 micro-tesla was the same as one milligauss and that 0.25 micro-tesla equalled 2.5 milligauss (N.T. pp. 1639-1640).

Cole explained that "RR" meant "relative risk" and agreed that in the Swedish residential study the RR for 0.25 micro-tesla for leukemia was 3.3, which he termed a marginally significant "RR" (N.T. p. 1640). He indicated that the increased risk for childhood leukemia becomes statistically significant when adjusted for socioeconomic status (N.T. p. 1641). When the RR is adjusted for car exhaust, it is marginally statistically significant but it is weaker than it has previously been (N.T. p. 1642).

In regard to Table 4.31 of the Swedish residential study, Cole testified that the authors did not report a statistically

significant increase in risk for childhood leukemia associated with a distance of a child's home from a powerline of zero to fifty feet (N.T. p. 1642). In a table labeled "Cancer Risk in Children in Relation to Distance to Powerline Restricted to One Family Houses", Cole indicated that authors reported a marginal statistical increase in risk for childhood leukemia at a distance of 50 feet from a powerline (N.T. p. 1643).

Cole stated that he did not believe the authors presented data to account for the difference in results from children living in single family dwelling to those living in apartments (N.T. pp. 1643-44). Cole verified that the authors offered an argument as to the difference in the two categories based on precision of calculated fields being possibly lower for apartment houses than for single family dwellings (N.T. p. 1644). He also verified that the authors indicated that it would take a shifting of one case from the lowest to highest exposure category among those in apartment houses to produce a relative risk of 1.8 for apartment dwellers (N.T. p. 1644). He also verified that the authors indicated an inability to take accurate measurements inside about one-third or 200 out of 626 apartments (N.T. p. 1645).

When asked if he agreed with the explanation presented, Cole stated that he agreed that the authors supported their idea that the precision of the estimates for apartment houses is poorer than it is for single family homes (N.T. p. 1645). He stated that imprecision of measurement could go either way and it is only an explanation for variability associated with the result

(N.T. p. 1646). He conceded it is a possible explanation, but not the explanation (N.T. p. 1646).

Cole cited the Swedish occupational study conducted by Floderus as one of three positive studies discussed in his written statement (N.T. pp. 1646-48). He confirmed the Floderus study used job histories and dosimeters to do EMF exposure assessment at the work site, but he indicated that less than 5% of the total employment experience was dose-assessed (N.T. p. 1647). He also indicated that the dosimeters were attached to workers who were not in the study but who now occupied the jobs that the study group occupied sometime in the past (N.T. p. 1648). The dosimeter readings taken were used by the researchers as a basis for assumption that the worker of 27 years ago was exposed to the same level of EMF exposure recorded today on the job (N.T. p. 1648).

In regard to the Sahl study, he categorized the study as negative and confirmed there were two approaches used in the study: one based on job title where a distinction is made between jobs related to energized equipment and other related job and one in which current workers wore dosimeters (N.T. pp. 1648-49). He stressed that although the Sahl study also used dosimeters on current workers, the period of time involving the retrospective nature of the study was somewhat shorter than that in the Swedish study so the exposure information is more likely to be accurate (N.T. p. 1649). Also he claimed that the Sahl study was a much more thorough assessment of the exposure in that a very substantial proportion of the work history was covered by the imputed dose assessment (N.T. pp. 1649-50). He believed the study was much more complete and much more

focused than the Floderus study in that all the workers in the study were workers within the utility industry (N.T. p. 1650). He agreed that the basic procedure was the same in both studies but believed that the depth, quantity and quality of the studies were not comparable (N.T. p. 1650). Cole indicated that the incidence of cancer is related to age but confirmed that the Sahl study did not publish any age-specific relative risks (N.T. p. 1651-52). He also indicated that the Sahl study did not provide any standard mortality ratios that compare age-adjusted cancer rates in the study population to the population at large (N.T. p. 1652).

When referred to a specific section of the Sahl study, Cole did not agree with the statement that the available data provide some support for the theory that field intensities found in the work environment may play a role in cancer promotion (N.T. p. 1653). He indicated that the statement was not part of the study, but a statement of background (N.T. p. 1653). He said he would not agree to it because it was a half-truth and that the statement could be modified to say the available data provide evidence against the theory because there is some evidence for it and some against it (N.T. p. 1653).

Cole reiterated the opinion that it was reasonable not to initiate any new studies until the existing group of third generation studies (of which the Sahl study is one) are completed (N.T. p. 1664). By third generation studies he meant studies using measurement-based exposure assessments (N.T. p. 1663). He indicated it will be six months before his second generation study would be

completed, and he anticipated that the third generation studies would be available after the first of the year (N.T. p. 1672).

Redirect

In regard to the Swedish residential study, Cole reiterated that with respect to the category of disease -- the study is small -- only 38 cases of leukemia in the study (N.T. pp. 1676-77). Cole also explained that statistical significance is a necessary but not sufficient criterion of meaningful association (N.T. p. 1677). However, in the Swedish residential study so many comparisons were made (10 forms of cancer, two time periods and three exposure assessments), one is going to see statistical significance attach due to chance (N.T. p. 1678). He added that the study is positive only for childhood leukemia and there were major flaws in that study that detract from any causal interpretation (N.T. p. 1678).

Cole testified that he knew where Dr. Sahl worked and that the third author of the study, Dr. Sander Greenland, was professor of epidemiology and biostatistics at UCLA, but did not pay attention to where authors were employed (N.T. p. 1679). He did pay attention to the individual reputations of the authors (N.T. p. 1679).

Cole commented on a criticism of the Sahl study -- the absence of age-adjusted "SMRs" (N.T. pp. 1679-80). He indicated that the study did in fact report age-adjusted risk ratios (N.T. p. 1679). He explained Sahl did a nested case-control study -- a study in a study -- and the focus of the analysis was on case-control components for lymphoma, brain cancer and leukemia in adults in the context of heavily exposed people (utility workers) (N.T. p. 1681). He stated the focus on the analysis and analytical tools is on those of the

case-control study not those of the follow-up study so the absence of a "SMR" is irrelevant (N.T. p. 1681).

Recross

On recross, Cole testified that there is no known human carcinogen that fails to show a dose-response relationship (N.T. p. 1682). He explained the Swedish study, although represented to be positive by its authors for leukemia, has a number of major detractions from a positive interpretation of its leukemia association: 1) the dose-response relationship is seen only with calculated magnetic fields and distance, which are in fact the same measure, and no dose-response when information is looked at in spot measurements; 2) there is no association in apartment homes; 3) the study was divided into two time periods and was negative in the larger of those time periods; 4) the study does not show dose-response with duration of residence within the transmission line corridor, but shows that children who live in the corridor for the longest period of time have the lowest risk of leukemia; and 5) the study shows 39 cases of leukemia observed and 35 cases expected, which are the same number when you are dealing with a large population over long periods of time (N.T. pp. 1683-84).

Cole testified that not only was the number of cases used in the childhood leukemia small, but the cases of brain tumor (33), the cases for children with lymphoma (19), the children with kidney tumors or Wilms tumor (10) and the 41 children who fell into other categories which were subdivided among a number of cancers were also small (N.T. pp. 1690-91). Cole added that by way of comparison of case studies in adults, there were typically 50, 60 or 70 or so,

double or triple the number of cases than for children (N.T. p. 1691-92). Cole did admit that the number of cases for adults with acute lymphatic leukemia was 14 (N.T. p. 1692).

Cole was asked about his statement on cross that the Sahl study did not include age-specific relative risk assessments, and on redirect that it contained age-adjusted data (N.T. p. 1692). Cole explained that age-specific relative risk pertains to a narrow segment of age, e.g. 40-59, or 60 and over, or under 20 (N.T. p. 1692). Age-specific means restricted to age (N.T. p. 1692). Age-adjusted means unrestricted as to age but manipulated statistically in such a way that comparisons are devoid of any effect of age (N.T. p. 1693).

EDWARD PAUL GELMANN -
Direct Testimony on Remand

Edward Paul Gelmann of 3800 Reservoir Road, N.W., Washington, DC is a medical doctor and teacher, specializing in medical oncology (PECO Direct on Remand No. 5, p. 1). He is Professor of Medicine, Professor of Anatomy and Cell Biology, and Chief of the Division of Medical Oncology at the Georgetown University Medical School (Id., p. 1). He testified previously in this proceeding on molecular genetics, cellular biology and cancer and the EMF research related to those areas (Id., p. 1).

Gelmann testified regarding the recent results of mutational analyses, chromosome studies and animal studies (Id., p. 2). He explained that "mutational analyses" were tests that show whether there was a permanent, heritable change to the cell's DNA, or "genetic material" which is essential for normal cells to be

transformed into cancer cells (Id., p. 2). He testified that three recent publications (Novelli et al., 1991; Fiorani et al., 1992; and Otaka et al., 1992), reported that exposure to power frequency electric and/or magnetic fields had no effects on mutations (Id., p. 2).

Gelmann also testified on chromosome studies, which evaluate whether there are breaks or damage to the chromosomes as a result of exposure to an agent (Id., p. 2). These studies provide information on an agent's potential to cause cancer or other adverse health effects (Id., p. 2).

Gelmann reviewed two recent chromosome studies (Id., p. 2). In one study (Livingston et al., 1991) researchers found no effect on chromosomes using several different assays of human lymphocytes and CHO (mammalian) cells exposed to 60 Hz magnetic fields (Id., pp. 2-3). In the second study (Ager & Radul, 1992) researchers found no effect on chromosomes in cells exposed to 60 Hz magnetic fields alone and no enhancement of chromosomal damage caused by ultraviolet radiation (Id., p. 3).

Gelmann then discussed recent animal studies involving EMF (Id., p. 3). Gelmann explained that animal studies have a broader potential than studies on isolated cells to tell researchers about genetic change or other adverse health effects on cells or groups of cells and whether any such changes are related to adverse health outcomes (Id., p. 3). As to recent research involving whole animals exposed to power frequency magnetic fields in combination with chemical agents (Mevisson et al., 1993; Rannug et al., 1993; McLean et al., 1991; and Stuchley et al., 1992), Gelmann testified that

magnetic field exposure did not increase the number of animals that developed cancer (Id., pp. 3-4).

Gelmann also noted that recent attempts to replicate previous work done on protein synthesis and RNA transcription by Goodman et al. have been unsuccessful (Parker & Winters, 1992) (Id., p. 4).

Gelmann then testified regarding new reviews of EMF research undertaken by Virginia Department of Health (1992 and 1993) and the Maryland Department of Health (1992) (Id., p. 5). He agreed with the conclusion of these reviews that the research on EMF remains unclear, and that adverse human health effects of EMF exposure have not been demonstrated (Id., p. 5).

Gelmann concluded that recent research did not alter the opinion to which he previously testified (PECO Rebuttal Statement No. 3, p. 22) that extensive research on molecular and cellular biology and cancer provides no scientific basis to conclude that power frequency fields cause, promote, or otherwise contribute to the development of cancer or other adverse health effect (PECO Direct on Remand No. 5, p. 5). Gelmann also testified that based on his area of expertise, there is no scientific or medical basis to develop a right-of-way width standard for transmission lines (Id., p. 5).

Cross-Examination

When questioned, Gelmann testified that he was not familiar with a study which was presented last week to the American Geophysical Union involving epilepsy patients exposed to weak magnetic fields reported in the May 31, 1993 Philadelphia Inquirer (N.T. pp. 1703-04). Gelmann also testified that he had not studied

as part of his testimony the potential of alteration of cells or subsets of cells through the interaction of magnetic fields and magnetites in the body, but he had read some papers on the subject (N.T. p. 1704). Gelmann explained that his conclusion that scientific research provides no basis to conclude that power frequency fields cause, promote or otherwise contribute to the development of cancer or other adverse health effects, did take into account at least one study on magnetite but does not include the study reported in the Philadelphia Inquirer (N.T. p. 1705). He also testified that he did not recollect if magnetites were located within the human body, and was not confident that there is a feasible mechanism for electromagnetic fields and cancer to be related because to his knowledge, there is no relationship between magnetite and the functioning of RNA (N.T. p. 1708).

SUMMARY OF ARGUMENT

At present, there is no conclusive evidence that electromagnetic fields (EMF) present any hazard to human health. Additional studies on EMF regarding immunological, epidemiological, molecular, cellular and whole animal research presented in this remand proceeding have not changed this conclusion, and do not establish a need to set right-of-way magnetic field standards, health-based or otherwise, for the Woodbourne-Heaton 230kV line or any other transmission line. Accordingly, the Woodbourne-Heaton line does not present an unreasonable risk to the health and safety of the public.

Prudent avoidance is a policy which involves modest capital expenditures to achieve reduction in EMF from electric facilities. Adoption of prudent avoidance as a Commission policy is appropriate as it allows construction and upgrading of electric lines to continue at reasonable cost in the face of scientific uncertainty regarding EMFs alleged adverse health effects. As such, prudent avoidance permits an electric utility to fulfill its statutory duty of providing safe and reliable service to the public at a reasonable cost.

In the instant proceeding, PECO has shown that the design and placement of the 230kV transmission line on the former Conrail railroad corridor will result in reduced EMF exposure to the general public and is thereby consistent with the concept of prudent avoidance. Parenthetically, evidence also shows that actual EMF levels expected from the Woodbourne-Heaton 230kV Line are in compliance with the standards set by the state of New York. For these reasons, PECO should be authorized to put this line into immediate service.

ARGUMENT

I. At Present, There Is No Conclusive Evidence That Electromagnetic Fields Present Any Hazard To Human Health.

As recognized by the Commission in its March 26, 1993 remand order, the record in this proceeding is inconclusive in regard to adverse health effects from exposure to EMF. Order entered March 26, 1993 at Docket No. A-110550,F.055, p. 16. The Commission, however, having been apprised of a new residential epidemiological study conducted in Sweden, believed that it was necessary to remand this proceeding to the Office of Administrative Law Judge to allow for the consideration of what was hoped to be better information on the subject (Id., p. 21).

In accordance with the Commission's remand order, the parties have presented on-the-record analysis of recent studies not considered previously in this proceeding on the association of electromagnetic fields with possible adverse human health effects. Philadelphia Electric Company presented the testimony of three witnesses, who previously testified in this proceeding.^{3/}

PECO's first witness, Dr. Richard Steven Bockman, a medical doctor, a researcher and a teacher in endocrinology and immunology, testified on recent studies involving human perception of magnetic fields, and the effect of EMF on calcium metabolism, biological

^{3/} OCA presented on remand the testimony of David Janes, Vice President of Risk Analysis Corporation, who had previously testified regarding biological effects seen in association with EMF (OCA Statement No. 1). Although his testimony on remand solely concerned various state policies for addressing EMF concerns, Janes reiterated his opinion that the connection between subtle, reversible effects seen in animals on exposure to EMF and adverse human health effects remains unclear (OCA Statement No. 1B, p. 2; N.T. p. 1626).

rhythms, reproduction and development, and immune system (PECO Direct on Remand No. 3).^{4/} Dr. Philip Cole, a professor and researcher in epidemiology and a medical doctor, testified on recent residential and occupational epidemiological studies that sought to link exposure to power frequency EMF with cancer in children and adults (PECO Direct on Remand No. 4).^{5/} PECO's third witness, Dr. Edward Paul Gelmann, a medical doctor, researcher and teacher specializing in medical oncology, testified regarding recent EMF research on molecular genetics, cellular biology and cancer (PECO Direct on Remand No. 5).^{6/} The three witnesses expressed opinions regarding that research as follows:

1. Dr. Bockman agreed with the conclusion of a scientific panel known as the Electro-magnetic Health Effects Committee Report for the Texas Public Utility Commission that research to date rejects the hypothesis that acute or prolonged exposure to EMF equivalent or several times stronger than those experienced under transmission lines results in the biologic disruption of the endocrine or immune systems (PECO Direct on Remand No. 3, pp. 4-5).
2. Dr. Cole concluded that the epidemiologic evidence on EMF when taken as a whole, provides no persuasive scientific support for the hypothesis that EMF causes cancer in children. Regarding adult cancer, he concluded that the body of studies does not support the hypothesis that EMF is associated with adult cancer, and that the best designed and conducted studies provide strong support against the hypothesis (PECO Direct on Remand No. 4, pp. 7 and 11).
3. Dr. Gelmann reiterated his previous conclusion that the scientific research provides no basis to conclude

^{4/} A summary of Dr. Bockman's testimony appears at pages 22-25 of this brief.

^{5/} A summary of Dr. Cole's testimony appears at pages 25-39 of this brief.

^{6/} A summary of Dr. Gelmann's testimony appears at pages 39-42 of this brief.

that power frequency fields cause, promote, or otherwise contribute to the development of cancer or other adverse health effects (PECO Direct on Remand No. 5, p. 5).

A review of the record reveals that the evidence, although getting stronger on the side of there being no adverse human health effects from EMF still remains inconclusive. Therefore, the Commission's determination regarding the inconclusiveness of the evidence on the adverse health effects of EMF as expressed in its March 26, 1993 order continues to be supported by substantial evidence in the instant expanded record, and should be reaffirmed by this Commission.

However, research involving the alleged association of EMF with adverse health effect continues^{2/} and should not be ignored. Therefore, the Prosecutory Staff recommends that the Commission continue to monitor literature and new studies involving EMF by appointing a committee or contracting with an outside source to produce yearly updates on EMF research for release to the public. Although the Prosecutory Staff has not extensively explored the possibilities, we surmise that the electric industry may be willing to finance such an activity.

^{2/} Dr. Philip Cole testified that third generation epidemiological studies involving EMF, i.e. those using measurement-based exposure assessments, which were in progress, would be available by the first of next year, and that his second generation study would be completed in six months (N.T. p. 1672).

II. Neither Right-of-Way Standards Nor Edge
Of Right-of-Way Field Measurement
Limitations Should Be Established For
The Philadelphia Electric Company's
Woodbourne-Heaton 230kV Line

The second issue which the Commission ordered be considered on remand was whether right-of-way EMF standards should be established for the Woodbourne-Heaton 230kV Line. Order entered March 26, 1993, Docket No. A-110550, F.055, p. 23. All the witnesses who testified at the remand hearing agreed that they did not recommend establishing standards for electromagnetic fields for the Woodbourne-Heaton 230kV Line. PECO's witnesses, Bockman, Cole and Gelmann, all testified that based on scientific and medical research, they saw no basis on which to develop an objective right-of-way width standard (PECO Direct on Remand No. 3, p. 5 and PECO Direct on Remand No. 5, p. 5), nor to establish limitations as to specific milligauss levels at the edge of the right-of-way (PECO Direct on Remand No. 4, p. 12). OCA's witness David Janes also testified that he did not recommend setting a standard for magnetic fields at the edge of the Woodbourne-Heaton line right-of-way (N.T. p. 1627). He believed it was premature to set a health-based standard because of scientific uncertainty about whether exposure to power frequency magnetic fields is harmful (N.T. p. 1627).

The Prosecutory Staff submits that the record on remand does not contain evidence to support the establishment of standards for the Woodbourne-Heaton 230kV Line right-of-way. To the contrary, all of the experts presented in this case recommended against setting standards.

The inconclusive nature of the scientific evidence on EMF, which on one hand recommends against the establishment of right-of-way standards for any transmission line including the Woodbourne-Heaton 230kV line, on the other hand requires the adoption of prudent avoidance^{8/} to meet public concern^{9/} generated by this inconclusiveness.

As argued by the Prosecutory Staff in its April 20, 1992 Brief, prudent avoidance is the preferable policy in the face of uncertainty.

[T]he application of prudent avoidance is not the recommended approach in the face of a "real problem", i.e., an established risk. However, as a policy, the adoption of the strategy of prudent avoidance allows transmission lines to go forward in the face of obvious scientific uncertainty. Prudent avoidance does not counsel that electric lines not be built or not be energized (PECO Rebuttal Statement No. 6, pp. 18-19). [See also OCA Statement No. 1B, p. 6, p. 18 Reference 11]. As such, adoption of prudent avoidance as a policy by the Commission would allow electric utilities to continue building, upgrading and reconstructing electric facilities consistent with an electric utility's obligation to fulfill its statutory duty to furnish and maintain adequate, efficient, safe and reasonable service and facilities for the accommodation, convenience and safety of its employees and the public. 66 Pa. C.S. §1501.

Prosecutory Staff's Brief, p. 39.

^{8/} Prudent avoidance in the context of managing electro-magnetic fields from transmission lines is the strategy of making those minimal cost modifications in the design and siting transmission lines that will reduce EMF exposure to the public. See generally, Prosecutory Staff Brief dated April 20, 1992, pp. 37-40.

^{9/} The Commission in its remand order indicated that the inconclusiveness of the scientific evidence on this subject formed the basis for the Protestants' concern. Order entered March 26, 1993 at Docket No. A-110550, F.055, p. 16.

As an approach to prudent avoidance, Prosecutory Staff favors its application on a case-by-case basis whereby an electric utility must use its expertise in system planning, line route and line design to propose a new, upgraded or replacement line which will allow for reduced levels of electromagnetic field exposure through modest cost efforts. We believe this approach is consistent with Pennsylvania case law which allows the selection of a transmission line route and design of the facilities to be left to the electric utility with review of the reasonableness of the decision left to the Public Utility Commission. Stone v. Pa. PUC, 192 Pa. Superior Ct. 573, 162 A.2d 18 (1960); Re Proposed Electric Regulation, 49 Pa. PUC 709, 710-711 (1976). The Commission in reviewing reasonableness of these decisions can then consider the factors recommended by OCA witness David Janes in his testimony which should be incorporated in such transmission line siting decisions (OCA Statement No. 1B, p. 16).

Although he recommended against the establishment of standards for the Woodbourne-Heaton 230kV Line, OCA witness David Janes did discuss a similarity-based approach to address public concern over EMF, such as that used by the state of New York in establishing right-of-way standards (OCA Statement No. 1B, pp. 7-9). The similarity-based approach simply attempts to make EMF exposure that people receive from transmission lines similar to those they receive from other sources in modern life including other transmission lines in the same voltage class (OCA Statement No. 1B, p. 6, p. 18 Reference 11 and PECO Rebuttal Statement No. 6, p. 18).

While the Prosecutory Staff does not support the establishment of EMF standards for transmission lines, we do see the value in comparing EMF from a specific line with those from typical lines in the same voltage class so that individual efforts at exercising prudent avoidance can be evaluated in the context of a typical line. To allow for such evaluations to take place we recommend that the Commission establish a data registry of expected and actual electric and magnetic fields for all future proposed lines.

To establish this registry, the Commission could require utilities to include in future transmission line filings a statement of the expected EMF level from a line (and each alternative of the line considered) under normal operational loading. Because rights-of-way can vary in width, it is suggested that estimated readings be reported at standard distances of 0, 50, 150 and 250 feet from the right-of-way centerline. Within 30 days of a line's being placed in operation, the utility could be required to report to the Commission the actual readings measured from the line at these standard distances.^{10/} The Prosecutory Staff suggests that responsibility for maintaining this data registry should rest with the Commission's Bureau of Conservation, Economics and Energy Planning.

^{10/} PECO's Woodbourne-Heaton 230kV Line could be the first line for which this data would be required to be filed. It is of a newer design which incorporates both the compact delta conductor configuration and phase rolls to reduce EMF fields (PECO Statement No. 6, p. 17). Thus, the Woodbourne-Heaton 230kV Line could be a standard against which future 230kV lines could be measured. This observation is not inconsistent with the advice of OCA witness David Janes who indicated that measurement of newer lines be used to develop similarity-based field standards (OCA Statement No. 1B, p. 15).

A registry of data of this type will provide the Commission with information not only to evaluate compliance with prudent avoidance, but also to promulgate right-of-way standards in the future for transmission lines if the science establishes a causal relationship between EMF and adverse health effects, and the establishment of standards becomes necessary.

III. The Location And Design Of The Woodbourne-Heaton 230kV Line Is Consistent With The Concept Of Prudent Avoidance So As To Justify PECO Placing The Line Into Immediate Service.

The instant record establishes that in designing and routing the Woodbourne-Heaton 230kV line, PECO has done all it reasonably can to lower public exposure to EMF: 1) using the compact delta conformation for the conductor (PECO Statement No. 2, pp. 12-13); 2) using phase rolls in stringing the line (PECO Rebuttal Statement No. 6, p. 17); 3) routing the line on an established utility corridor so as to avoid more concentrated areas of population (PECO Rebuttal Statement No. 5, pp. 11, 12-15) and 4) increasing ground clearance for the line above required levels (PECO Rebuttal Statement No. 4, p. 7; PECO Statement no. 1, p. 10). Calculations done to estimate the levels of EMF expected from the Woodbourne-Heaton line suggest levels similar to those from other 230kV lines, and such levels are, in fact, within the range that people routinely encounter in their daily activities (PECO Rebuttal Statement No. 6, pp. 18, 19). At the edge of the Woodbourne-Heaton right-of-way, over 90% of the time, the magnetic fields will not exceed 20MG. At the edge of the wider Conrail corridor in which the Woodbourne-Heaton right-of-way is located, the expected magnetic fields will be in the

range of approximately 19MG to well under 0.5MG (PECO Direct on Remand No. 2, pp. 2-3). Thus, PECO's Woodbourne-Heaton line already comports with the concept of prudent avoidance.^{11/}

Furthermore, the delay in energization of the Woodbourne-Heaton 230kV line, which was built at a construction cost of \$15.5 million, is not an economically reasonable, i.e., modest or low cost, step to avoid EMF exposure to the public. As such, delay in energizing the line is a drastic response not warranted by the situation and is neither logically nor economically consistent with the concept of prudent avoidance.

Moreover, Prosecutory Staff submits that PECO has sufficiently satisfied the requirement under 52 Pa. Code §57.76(a)(2) that the line must not pose an unreasonable risk of danger to the health and safety of the public before an application for a line can be approved. The existence of public concern over the uncertainty of the alleged EMF/adverse health effects issue is not enough to deprive PECO and its ratepayers of the use of this important and necessary asset. Therefore, the Prosecutory Staff believes that the Commission should reaffirm its February 3, 1990 approving PECO's November 21, 1989 Letter of Notification for the Woodbourne-Heaton line, and should allow PECO to put the Woodbourne-Heaton 230kV line into immediate operation.

^{11/} Undergrounding a line on the Conrail utility corridor between the Woodbourne and Heaton 230kV substation or purchasing all property along the corridor where magnetic field exposure would be greater than 1MG for more than 5% of the time would not be consistent with principles of prudent avoidance in that neither proposal is of modest or low cost (PECO Rebuttal on Remand No. 1, p. 1; PECO Rebuttal on Remand No. 2, pp. 3-4; PECO Rebuttal on Remand No. 3, p. 2; N.T. pp. 1595-1596).

PROPOSED FINDINGS OF FACT

The Prosecutory Staff incorporates by reference the proposed findings of fact presented in its April 20, 1992 Brief at pp. 45-54, and adds the following:

1. The National Electrical Safety Code requires a right-of-way width of approximately 60 feet (approximately 30 feet on either side of the transmission line) for the Woodbourne-Heaton Line. This 60-foot right-of-way is contained within a wider existing utility corridor owned by Conrail (PECO Direct on Remand No. 1 [Oedemann] at p. 2).

2. Woodbourne-Heaton's existing utility corridor has several existing or recent public utility uses, including: 1) an active Conrail single track freight rail system which consisted of two railroad tracks until 1991; 2) until 1986, an electric 132kV transmission line operated by Amtrak as part of its bulk power system; 3) a Conrail power feed and signal communications system; and 4) the Woodbourne-Heaton 230kV transmission line (PECO Direct on Remand No. 1 [Oedemann] at p. 2).

3. The existing utility corridor between the Woodbourne and Heaton substations, as measured at the transmission structures, is approximately 100 feet wide at its narrowest points and approximately 995 feet wide at its widest points. The average width of the corridor is approximately 310 feet (PECO Direct on Remand No. 1 [Oedemann] at p. 2).

4. The Woodbourne-Heaton line has 238 poles. At 12 of these poles, one side of the right-of-way is coterminous with the edge of the existing utility corridor. At three locations along the

utility corridor where the edge of the Woodbourne-Heaton right-of-way is the same as the edge of the Conrail-owned utility corridor, the adjoining land uses consist of commercial property, and electrical contractor, and land with abandoned vehicles and construction equipment (N.T. pp. 1581-1583; PECO Direct on Remand No. 1 [Oedemann] at p. 3).

5. The remaining 226 poles the Conrail-owned utility corridor extends beyond the edge of the Woodbourne-Heaton right-of-way on both sides of the transmission line. For these 226 poles, the distance from the Woodbourne-Heaton line to the edge of the Conrail-owned utility corridor ranges from approximately 40 to 740 feet (PECO Direct on Remand No. 1 [Oedemann] at p. 3).

6. Magnetic fields are created by the flow of electric current through a conductor. The unit of measure of the magnetic field is expressed in milligauss ("MG") (PECO Direct on Remand No. 2 [Boeggeman] at p. 2).

7. A number of factors contribute to the strength of the magnetic field associated with a transmission line at any point in time and space, including the amount of current flowing through the conductors (amperage), the configuration (design) of the transmission line, and distance from the line (PECO Direct on Remand No. 2 [Boeggeman] at p. 2).

8. For the Woodbourne-Heaton line, the magnetic fields expended under normal operating conditions, i.e., the conditions that will exist over 90% of the time, will not exceed 26MG at the edge of the right-of-way (PECO Direct on Remand No. 2 [Boeggeman] at p. 2).

9. No right-of-way standard for magnetic fields should be established for the Woodbourne-Heaton 230kV Line (N.T. p. 1627; PECO Direct on Remand [Bockman] at p. 5; PECO Direct on Remand No. 4 [Cole] at p. 12).

10. The cost of placing an underground cable on the Conrail utility corridor to electrically connect the Woodbourne and Heaton Substations would be approximately \$38.5 million and would take approximately two years to complete. Additional cost to the utility would include increased cost of maintenance required for an underground line (N.T. pp. 1586-1587; PECO Rebuttal on Remand No. 1 [Oedemann] at p. 1).

11. The cost of purchasing along the Woodbourne-Heaton 230kV Line all properties, any portion of which would be within magnetic field levels above one milligauss for more than 5% of the time, would be at least \$160 million (N.T. pp. 1595-1596; PECO Rebuttal on Remand No. 3, p. 2).

12. The electric and magnetic fields produced by the Woodbourne-Heaton 230kV Line do not exceed New York and Florida standards (PECO Direct on Remand No. 2 [Boeggeman] at p. 3; OCA Statement No. 1B [Janes] at pp. 13-14).

13. Florida's existing and standards for a transmission line electric field strength on the right-of-way is 8kV/m and at the edge of the right-of-way is 2kV/m for 230kV or smaller lines; the standards for the magnetic field at the edge of the right-of-way is 150mG (max load) for 230kV or smaller lines. (OCA Statement No. 1B [Janes] at p. 9).

14. New York's existing standards for the electric field on the right-of-way is 11.8kV/m and at the edge of the transmission right-of-way is 1.6kV/m; the magnetic field strength standard at the transmission edge of the right-of-way is 200MG (OCA Statement No. 1B [Janes] at p. 9).

15. Prudent avoidance involves limiting EMF exposures to the general public via small and modest investment of money or effort (PECO Direct on Remand No. 2, p. 3).

16. The design and location of the Woodbourne-Heaton 230kV Line achieve reduced EMF field levels at modest or no additional cost and as such the line is consistent with principles of prudent avoidance (PECO Direct on Remand No. 2 [Boeggeman] at pp. 3-4).

17. Undergrounding a transmission line on the Conrail corridor between the Woodbourne and Heaton substations or purchasing all properties, any portion of which would be within magnetic field levels above one milligauss for more than 5% of the time, would not be consistent with principles of prudent avoidance as the cost involved would be significant (PECO Rebuttal on Remand No. 2 [Boeggeman] at pp. 3-4).

18. With respect to magnetic fields, there remains no evidence to date to indicate that humans can perceive power frequency magnetic fields at levels associated with transmission lines or even at levels that far exceed those associated with transmission lines (PECO Direct on Remand No. 2 [Bockman] at p. 2).

19. Power frequency electric and/or magnetic fields (60 Hz) do not modulate cell function or endocrine system function by

altering calcium metabolism (N.T. pp. 1540-1546; PECO Direct on Remand No. 2 [Bockman] at p. 2).

20. Rat melatonin studies do not provide a basis for concluding that power frequency fields lead to adverse effects on human biologic rhythms (PECO Direct on Remand No. 3 [Bockman] at p. 3).

21. Power frequency electric and/or magnetic fields several times stronger than those associated with transmission lines do not biologically disrupt the endocrine or immune systems (PECO Direct on Remand No. 3 [Bockman] at pp. 3-5).

22. Taking into account epidemiological research on childhood cancer, including the recent Swedish residential study conducted by Feychting and Ahlbom, there is no demonstrated increased risk of childhood cancer associated with exposure to electromagnetic fields (PECO Direct on Remand no. 4 [Cole] at p. 7).

23. Taking into account epidemiological research on adult cancer, including the Swedish residential study conducted by Feychting and Ahlbom, the Danish occupational study conducted by Guenel et al. and the Southern California occupational study conducted by Sahl et al., there is no demonstrated risk of adult cancer associated with exposure to electromagnetic fields (PECO Direct on Remand No. 4 [Cole] at pp. 11-12).

24. A permanent, heritable change to the cell's DNA, or genetic material is essential for normal cells to be transformed into cancer cells (PECO Direct on Remand No. 5 [Germann] at p. 2).

25. Extensive research on molecular and cellular biology and cancer provides no scientific basis to conclude that power

frequency fields cause, promote or otherwise contribute to the development of cancer or other adverse health effects (PECO Direct on Remand No. 5 [Gelmann] at p. 5).

PROPOSED CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the parties and the subject matter of this proceeding.

2. The Woodbourne-Heaton 230kV Line does not pose an unreasonable risk to the health and safety of the general public.

3. Neither electric or magnetic field right-of-way standards should be adopted for the Woodbourne-Heaton 230kV Line.

4. The Woodbourne-Heaton 230kV Line constructed by Philadelphia Electric Company comports with principles of prudent avoidance.

5. The Letter of Notification filed by Philadelphia Electric Company substantially complies with the Commission's siting regulations at 52 Pa. Code §§57.71, et seq.

PROPOSED ORDERING PARAGRAPHS

In consideration of the foregoing, IT IS ORDERED:

1. The Emergency Petition of Non-Noticed Property Owners to Intervene for Reopening and to Suspend Approval is hereby denied.

2. The Letter of Notification filed by Philadelphia Electric for the Woodbourne-Heaton Line is hereby reaffirmed.

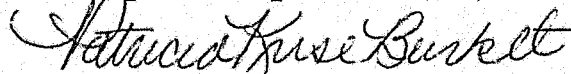
3. The Woodbourne-Heaton transmission line must be operated and maintained in accordance with the National Electrical Safety Code.

4. The transmission line must be operated and maintained in compliance with all applicable statutes and regulations for the protection of the public and the natural resources of the Commonwealth.

CONCLUSION

WHEREFORE, the Commission should decline to establish electromagnetic field standards for the Woodbourne-Heaton 230kV line; should adopt as policy the concept of prudent avoidance for the siting and design of future transmission lines; should monitor literature and new studies involving EMF to produce yearly updates on EMF research for release to the public; should establish a data registry of expected and actual electric and magnetic fields for all future proposed transmission lines; and should reaffirm its February 3, 1990 order approving Philadelphia Electric Company's Letter of Notification, filed at Docket No. A-110550, F.055.

Respectfully submitted,



Patricia Krise Burket
Assistant Counsel

Pennsylvania Public Utility Commission
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Dated: June 15, 1993

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has been served on this date on the following persons in the
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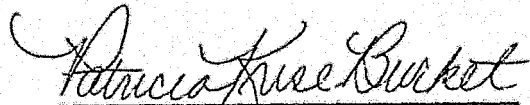
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RECEIVED
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PA. P. U. C.
INFO. CONTROL DIV.

Re: Letter of Notification of Philadelphia
Electric Company Relative to
Reconductoring and Rebuilding of the
Existing 138-KV Line to Operate as the
Woodbourne-Heaton 230KV Line
Docket No. A-110550 F055

Dear Secretary Alford:

Enclosed please find for filing an original and nine
copies of the Brief of the Office of Consumer Advocate on Remand
in the above-captioned proceeding.

Copies have been served upon all parties of record as
shown on the attached Certificate of Service.

Sincerely,

Tanya J. McCloskey
Assistant Consumer Advocate

Enclosures
cc: All parties of record

DOCUMENT
FOLDER

CERTIFICATE OF SERVICE

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconductoring and Rebuilding of the Existing
138-KV Line to Operate as the Woodbourne-Heaton 230KV Line
Docket No. A-110550F055

I hereby certify that I have this day served a true copy
of the foregoing document, Brief of the Office of Consumer Advocate
on Remand, upon parties of record in this proceeding in accordance
with the requirements of 52 Pa. Code § 1.54 (relating to service by
a participant), in the manner and upon the persons listed below:

Dated this 15th day of June, 1993.

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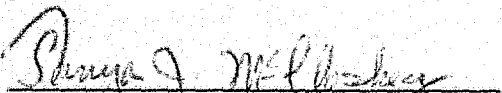
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ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF :
PHILADELPHIA ELECTRIC COMPANY :
RELATIVE TO RECONDUCTORING : Docket No. A-110550 F055
AND REBUILDING OF THE EXISTING :
138-KV LINE TO OPERATE AS THE :
WOODBOURNE-HEATON 230KV LINE :

DOCKETED
JUN 30 1993

OFFICE OF CONSUMER ADVOCATE
BRIEF ON REMAND

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PA. P. U. C.
INFO. CONTROL DIV.

DOCUMENT
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52 Pa. Code § 57.72(d)(1) 1

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I. INTRODUCTION AND PROCEDURAL HISTORY.

The Office of Consumer Advocate ("OCA") included within its Main Brief of April 20, 1992, a detailed procedural history. OCA Main Brief ("M.B.") at 1-10. The OCA will not, therefore, repeat the procedural history of this case in detail at this juncture. Rather, in order to place the substantive argument in context, the OCA will summarize the procedural history briefly in this introduction. The OCA submits that the fact that the Protestants herein have never been afforded an opportunity to be heard on all of the issues which require adjudication prior to Public Utility Commission ("PUC" or "Commission") approval of a transmission line siting application remains an important consideration which has not been fully addressed by the Commission. Because that issue was fully briefed prior to this remand, however, it will not be discussed again herein. See OCA M.B. at 14-18; R.B. at 1-4.

A. Procedural History Prior to Initial Decision.

This matter commenced on November 21, 1989, when Philadelphia Electric Company ("PECO" or "Company") submitted a Letter of Notification in lieu of a siting application to the Commission pursuant to 52 Pa. Code § 57.72(d)(1). Through that Letter of Notification, PECO proposed the rebuilding and reconductoring of an abandoned railroad 138 kV transmission line. The transmission line was to be located along a Conrail railroad line in order to connect the Woodbourne and Heaton substations, and has been referred to throughout this proceeding as the Woodbourne-

Heaton line. That Letter of Notification was approved by the Commission on February 9, 1990.

An "Emergency Petition of Non-Noticed Property Owners to Intervene for Reopening and to Suspend Approval" of PECO's Letter Notification for the Woodbourne-Heaton line was filed by seventy-four adjacent landowners and a group called "Parents Against an Unsafe Environment," also known as "PAUSE". The Office of Consumer Advocate noticed its intervention in this proceeding on January 3, 1991, and submitted a "Statement in Support of the Emergency Petition," asserting that, although it took no position on the merits of the PECO Letter of Notification, due process grounds existed for opening the Commission order approving it. A Commission Order of March 6, 1991 found it unnecessary to decide the PAUSE Petition to Intervene, but also denied the Petitioners' request for a stay of construction of the line, determining that the standards set forth in Virginia Petroleum Jobbers Association v. Federal Power Commission, 259 F.2d 921 (D.C. 1958) had not been met.

An April 2, 1991, appeal to the Commonwealth Court by the Protestants resulted in a remand order on May 24, 1991. Small, et al. v. Pa. P.U.C., No. 761 C.D. 1991, Slip Op., May 24, 1991. The Honorable Madeline Palladino stated that the Commission regulations within 52 Pa. Code §57.72(d) did not contemplate the "fact matrix" before the Court, that the notice required by the regulations was insufficient as to adjoining landowners, and that the Commission regulations, 52 Pa. Code §57.72(c)(11), do not provide the notice

and opportunity to be heard to which the Protestants were entitled. Id., at 1-2.

The Commission Order subsequent to the Commonwealth Court remand limited the issues to whether the Petitioners would be adversely affected by the line. Commission Order of June 14, 1991. Administrative Law Judge Smolen's Order of July 18, 1991, followed the Commission's Order limiting the issues, and specifically excluded the issue of whether the line is needed.

An extensive record was subsequently developed concerning EMFs, the Woodbourne-Heaton transmission line design, actions by the Company with respect to the line in light of some of the Commission's regulatory standards and the line's impact and potential for impact upon the adjacent landowners. ALJ Smolen issued his Initial Decision on August 19, 1992. The ALJ recommended to the Commission that until the Commission develops and adopts new EMF standards, the Woodbourne-Heaton line should not be energized. I.D. at 207-212. His rationale for this recommendation was the inconclusive nature of the scientific evidence of record as to the impact of electromagnetic fields ("EMF") and the inadequacy of the Commission's existing standards in light of this uncertainty. Id.

B. Procedural History Subsequent to Initial Decision.

Exceptions were filed by the parties to that Initial Decision and by the Office of Trial Staff ("OTS"). Duquesne Light Co., Metropolitan Edison Co., Pennsylvania Electric Co., Pennsylvania Power Co., West Penn Power Co., and UGI Utilities,

Inc., jointly petitioned to intervene; however, those petitions were subsequently denied by the Commission's order of March 26, 1993.

The Commission issued its Opinion and Order on March 26, 1993. The Commission's concerns about deciding this matter centered upon a study issued subsequent to the close of the record concerning the potential effects of cancer in persons residing near Swedish high voltage power lines: "Magnetic fields and cancer in people residing near Swedish high voltage power lines" by the Institute for Miljomedecin, Karolinska Institute (1992). Commission Opinion and Order of March 26, 1993, at 21. The Commission stated as follows:

We note that the record concerning EMF has been extensively developed, but prior to our disposition of the instant matter we shall direct a limited remand. Our opening of the record to secure an important piece (sic) of information appeals to our sense of fairness. However, we cannot go on forever in hope that the next piece of evidence or study will resolve the EMF question once and for all. . .

Because the justification for remand is that additional hearings will allow us to consider better information, we would not restrict the scope of the hearings on remand to the only study about which we happen to be aware. Other studies may have become public since the close of the record in this case. We would, therefore, direct the ALJ to consider all of these studies which the parties feel are relevant.

Id. The Commission thus ordered specifically that:

1. This matter be remanded to the Office of Administrative Law Judge for the purpose of:
 - a. receiving evidence and comment regarding all studies of the health

effects of magnetic fields which are available on or before the hearings on that evidence commence; and

- b. determining, in light of findings regarding health effects, what, if any, standards should exist for right-of-way-width for the Woodbourne Heaton 230kV line.

Commission Opinion and Order of March 26, 1993, at 22-23.

Pursuant to the Commission's Order, and the ALJ's procedural schedule, additional Direct Testimony was submitted on May 12, 1993 by PECO and the Office of Consumer Advocate, relevant to the issues as limited by the Commission's March 26, 1993 Order (hereinafter "Remand Order"). The Protestants, PP&L, and the Prosecutory Staff of the Commission's Law Bureau submitted written position statements. Brief Rebuttal Testimony was submitted by PECO. Hearings for the introduction of written direct and rebuttal testimony and cross-examination thereon were held on May 27-28 and June 1, 1993.

This Brief is submitted by the OCA in accordance with the ALJ's Order of June 4, 1993. The summary of OCA testimony, proposed findings of fact and conclusion of law are set forth in Appendices A and B attached hereto.

II. STATEMENT OF QUESTION INVOLVED

A. Whether, in light of available evidence concerning health effects of exposure to electromagnetic fields, right of way standards should be established for the Woodbourne-Heaton line.

Suggested Answer: No numerical right-of-way standard should be established for the Woodbourne-Heaton line at this time, based upon the evidentiary record herein.

III. ARGUMENT

A. Introduction.

In its initial direct case, the Office of Consumer Advocate offered the testimony of two witnesses, David Janes and David Rosenbaum of Risk Analysis Corporation. See OCA Main Brief, Appendix A (Summaries of OCA Direct and Surrebuttal Testimony). Mr. Janes testified for the purpose of explaining the effect of power frequency fields upon biological systems. OCA St. 1 at 2. It was Mr. Janes' opinion that weak electric field effects upon biological systems occur, but the connection between these effects and any harm to human health is unclear. Since weak field effects occur, the possibility of harmful effects cannot be summarily or categorically rejected and concerns about harmful effects are legitimate. Id. at 10.

Dr. Rosenbaum testified as to the difficulty of proving a cause-and-effect relationship utilizing epidemiologic studies and as to the uncertain picture presented by the studies summarized. OCA St. 2 at 5-6. He went on to set forth the public policy considerations which are required in the face of the level of uncertainty presented by the available scientific information concerning EMF. OCA St. 2 at 7-8.

In this limited remand proceeding, the OCA presented additional testimony by David Janes¹, wherein he reiterated his

¹ Mr. Janes has had over thirty years of experience in analyzing the effects and risks of exposure to ionizing and nonionizing radiation, including seven years as Director, Analysis and Support Division, Office of Radiation Programs, U.S. Environmental Protection Agency. OCA St. 1, at 1; Exh. DEJ-1.

conclusion that the connection between weak field effects and harm to human health is unclear, as the literature reviews and other studies made available since the close of the record prior to remand do not alter the validity of that conclusion. OCA St. 1B at 2. Mr. Janes reviewed the Swedish occupational and residential studies, noting that both positive and negative associations were reported, the most troublesome being the positive association between childhood leukemia and magnetic field exposure in the Swedish residential study. OCA St. 1B at 4.

In addition, Mr. Janes reviewed the state actions taken thus far and the prudent policy alternatives available to regulators, concluding that it is not possible to establish a health-based numerical standard at this time. OCA St. 1B at 11. Finally, although he did not recommend that the Commission set an edge of right-of-way standard for the Woodbourne Heaton line in this proceeding, he did suggest a method for developing a "similarity-based" standard incorporating concepts of prudence, if the Commission were to deem it necessary to proceed in this manner. OCA St. 1B at 15-17. This alternative will be discussed further below in Section III.C.

B. Available Evidence Does Not Support The Establishment Of A Health-Based Numerical Right Of Way Standard For The Woodbourne-Heaton Line.

1. Introduction.

As was set forth by the OCA in the phase of the case following the remand to the Commission by the Commonwealth Court, the only issues which were to be addressed according to the

Commission and the ALJ were those relevant to whether the Protestants were adversely affected by the reconductoring and energization of the Woodbourne-Heaton line. OCA M.B. at 8-9. The OCA concluded that the Protestants met their burden of showing that they were adversely affected. OCA M.B. at 18-19. Indeed, the Commission also accepted "the ALJ's conclusion as to the reasonableness of the Protestants' fear concerning potential adverse health effects from EMF generally, and to a lesser degree their fear of EMF from the subject line." Commission Order of March 26, 1993, at 19. Despite the acceptance of the ALJ's conclusion, the Commission did not endorse the ALJ's recommendation as to the delay in energization of the line. Id. Thus, the order issued remanding for consideration of whether a standard should exist for this line. Id. at 23.

Although right of way widening was one of the "mitigative measures" testified to by Dr. Rosenbaum, the parties did not specifically address the issue of whether the width of the right of way should be altered for the Woodbourne-Heaton line. By virtue of the Commission's March 26, 1993 Remand Order, the parties were placed in the position of addressing any new studies, in addition to addressing the new issue of whether a right-of-way standard should be "established" through this proceeding.

The witnesses who testified in this remand proceeding were of the general opinion that the new studies available since the close of the record do not resolve the questions concerning the effects of EMF on human health. (Section III.B.2.) In addition

and for a variety of reasons, the witnesses were of the opinion that a numerical right-of-way "standard" should not be established through this proceeding. (Section III.B.3.) In an attempt to be responsive to the concerns expressed in the Commission's Remand Order, however, OCA witness Janes testified to a possible methodology for establishing such a standard, although on an interim and line-specific basis.

The OCA submits that in light of the evidentiary record created on remand, the Commission should not set a numerical edge of right of way standard for the Woodbourne-Heaton line. Rather, the Commission should adjudicate this case and proceed in another docket to fully and thoroughly address the "standards" issue, if it deems that avenue appropriate.

2. Studies Available Since The Close Of The Initial Record Do Not Resolve The Uncertainty Concerning A Connection Between Exposure To EMF And Effects Upon Human Health; However, Improved Methodologies Are Being Employed And Statistically Significant Positive Results Have Been Obtained.

The OCA offered the Additional Direct Testimony of Mr. David Janes to assist in interpreting the results of the epidemiological studies which have become available since the close of the record in this case. OCA St. 1B AT 4-5. Mr. Janes noted that with respect to adult leukemia, the Swedish occupational study reported a positive association between exposure to magnetic fields and the incidence of chronic lymphocytic leukemia, while in the Swedish residential study, the association appears to be negative.

OCA St. 1B at 4. Moreover, Mr. Janes noted that the positive association between magnetic field exposure and childhood leukemia, and negative association for brain tumors reported by the recent Swedish residential study--are at variance with the earlier Swedish Tomenius study, reporting a lower number of leukemia cases and a higher number of brain tumors. Id. at 4.

He further concluded that without a demonstrated biophysical mechanism to connect the results of the epidemiological, animal and cellular studies, the results are not strong enough to establish a causal link. Id. at 5. On the other hand, Mr. Janes expressed the opinion that the experimental evidence makes the hypothesis of harmful effects plausible and the possibility of harm cannot be summarily dismissed. Id. Indeed, Mr. Janes pointed out that the most troublesome of the new results is the association between childhood leukemia and magnetic field exposure in the Swedish residential study, as that result is a fairly consistent observation "across the studies." OCA St. 1B at 4; Tr. 1612-1613.

The Company offered the additional Direct Testimonies of Richard S. Bockman, Philip Cole and Edward P. Gelmann. Dr. Bockman reviewed the EMF research in the area of Endocrinology and Immunology since his previous testimony. PECO Direct on Remand No. 3 at 1. His conclusion was that EMF research concerning endocrine and immune function appears to reject the hypothesis that acute or prolonged exposure to EMF results in biologic disruption of endocrine or immunologic systems. Id. at 5. Dr. Gelmann reviewed

recent EMF research on molecular genetics, cellular biology and cancer since his previous testimony. PECO Direct on Remand No. 5 at 1-2. He testified that it is still his opinion, as stated in his previous testimony, that the scientific research in his field provides no basis to conclude that power frequency fields cause, promote or otherwise contribute to the development of cancer or other adverse health effects. Id. at 5.

Dr. Philip Cole identified epidemiological studies and materials concerning power frequency electric and/or magnetic fields that have become available since his previous testimony. Dr. Cole provided his professional opinions and conclusions regarding those studies. PECO Direct on Remand No. 4. Dr. Cole focused upon three recent reports relevant to childhood cancer, Feychting & Ahlbom (1992), Olsen (1992), and Jones, et al. (1993). Id. at 2. The first is referred to as the "Swedish residential study," which is the same study that was reviewed by OCA witness Janes.

Dr. Cole testified that because 142 cases of childhood cancer occurred in the population living proximate to transmission lines, while 138 would have been expected to occur, the study provides "very strong evidence that this is a negative or null hypothesis." Id. at 3. He also concluded that the study was negative for "all cancers" and brain cancers, but weakly positive for leukemia. Id. at 5.

On cross-examination by the OCA, however, Dr. Cole agreed that the Swedish study was "large and complex," "gave impressive

attention to detail," and that in some respects the study improves the methodology that was used in the early epidemiological research regarding EMF. Tr. 1635-1636. Specifically, he agreed that the use of the first of the three different measures of EMF utilized by the Swedish researchers, i.e. calculated historic fields, contributed an additional approach not previously used. Tr. 1637. That measure, he testified, provides a more detailed estimate, although not necessarily a more accurate measure of actual exposure experienced by individuals. Id.

Dr. Cole also agreed that the Swedish residential study obtained statistically significant results for "Cancer Risk in Children in Relation to Calculated Magnetic Fields Closest in Time to Diagnosis, Cutoff Points at 0.1 and 0.25 Microtesla."² Moreover, he agreed that the increased risk for childhood leukemia is statistically significant when the "relative risk" ("RR") is adjusted for socio-economic status. Tr. 1641. In addition, the results showed a result "right on the threshold of statistical significance" related to increased risk for childhood leukemia associated with the distance of a home to a powerline of zero to fifty meters. Tr. 1642-1643.

In light of Mr. Janes' summation of the mixed results of the Swedish studies and Dr. Cole's additional testimony on cross-examination, Dr. Cole's unqualified general statement that the

² One milligauss is approximately the same as 0.1 microtesla; 2.5 milligauss is approximately the same as 0.25 microtesla, and so on. Tr. 1639-1640.

Swedish study is "strong evidence of a null hypothesis" appears to be an overstatement of the case. In addition, he testified that there is still some evidence for and some evidence against the theory that field intensities in the work environment may play a role in cancer promotion or progression. Tr. 1652-1653.

Taking the evidence on remand as a whole, it can fairly be said that despite differences in the expert witnesses' opinions concerning how the available literature in all genres material to this question should be interpreted, we are still uncertain whether EMF causes harmful effects. Thus, the question still remains to what extent and how a state agency empowered to regulate electric utilities should react, in the course of adjudicating siting applications. It should be noted that the only witnesses who have addressed the public policy alternatives for responding to this perplexing issue are Mr. Janes and Dr. Rosenbaum.

3. Any Non-Health-Based Right-Of-Way Standard Established Upon This Record Should Be Interim And Line-Specific.

The OCA submits that it is important that the Commission recognize that in light of all of the evidence, both in the initial evidentiary phase and on remand, the state of scientific knowledge cannot support the establishment of a health-based standard at this time. The witnesses who testified were in general agreement in this regard, although for different reasons. Dr. Cole for example, stated that:

The epidemiologic research thus provides no reason to set any standards related to this line. Moreover, it does not provide any effective basis for setting such a standard.

PECO Direct on Remand No. 4, at 12. Drs. Bockman and Gelmann expressed their opinions that review of the scientific evidence in their respective specialties provided no reason for setting magnetic field right of ways. PECO Direct on Remand No. 3, at 5; No. 5, at 5, respectively.

Mr. Janes testified that even the two states, Florida and New York, which have adopted edge of right of way magnetic field standards do not represent them as health-based standards. OCA St. 1B at 7. Two states' Public Service Commissions, California and Maryland, have taken the position that no standards are warranted at this time. Id. at 9. The Colorado Public Utilities Commission has adopted a rule that stresses prudent avoidance, but sets no numerical limits. Id. Similarly, Ohio requires applicants for certification of electric transmission facilities to address possible health effects in consideration of EMF design alternatives. Id.

PECO witness Oedemann testified in order to provide additional facts concerning the line and the right-of-way, and did not address the issue of whether a standard should be established. PECO Direct on Remand No. 2. PECO witness Boeggeman reviewed the magnetic field levels associated with the line, and asserted that the line was consistent with regulatory standards set by the New York and Florida Commissions, and consistent with the concepts of prudent avoidance. PECO Direct on Remand No. 2. He did not, however, address whether a specific standard should be established.

It is important to note, however, that none of the witnesses in this proceeding, whether initially or on remand, considered any evidence on the issue of whether the line is needed, as that issue was specifically excluded from consideration in this proceeding. See OCA M.B. at 8-9. Witness Boeggeman thus applied the concepts of "prudent avoidance" to an existing line on an existing right of way. Tr. 1559. As Mr. Janes pointed out on cross-examination by Mr. Sugarman, however, only the risk side of the risk-benefit analysis has been considered throughout this proceeding - and he would not make a judgment on even an interim standard, without having some understanding of what the benefit of the line was. Tr. 1617-1618. It is apparent that a full evidentiary record on all of the issues which should have been initially considered, including that of the need for the Woodbourne-Heaton line, and alternative routes, would be required in order for a meaningful application of "prudent avoidance" principles to this line.

Nonetheless, OCA witness Janes set forth a manner through which similarity and prudence concepts could be incorporated into the regulatory process to set numerical standards for this line, should the Commission wish to proceed to do so. First, cognizance should be taken of all of the prudence measures addressed by Dr. Rosenbaum earlier in this proceeding. OCA St. No. 1B at 15-16. Then, it must be recognized that in light of the considerable research, planned and already underway, any standard must be considered an interim one, not based upon avoidance of health

effects. Id. at 16. Moreover, any numerical limit should apply only to the line in question, and not to other lines for which the application of prudent avoidance standards could lead to differing results.

As Mr. Janes testified:

With these conditions, the Commission, as an interim measure, could adopt a similarity and prudence based standard for the Woodbourne-Heaton line using the fields produced by 230-kV lines of modern design as a basis, not necessarily just those in Pennsylvania. Using the fields produced by newer lines, where minimization of electric and magnetic fields has been included in the design, will incorporate a measure of prudence into the interim standard.

Id. at 16-17. The Commission should note, however, the importance of applying the principles of "prudent avoidance" in advance of considering whether to approve a line. Notably, as Dr. Rosenbaum testified, public participation is an important public policy consideration which should be part of the regulatory process where potential impacts upon health may come into play. OCA St. 2 at 8, OCA St. 1B at 15-16. The Commission's regulations do not provide for advance notice to adjacent landowners where letter of notification procedures may be invoked, much less advance public participation. 52 Pa. Code §57.72(d)(3). In addition to adjudicating this matter, the Commission should respond by ensuring that future applicants provide actual notice to affected landowners. See OCA M.B. at 55-58.

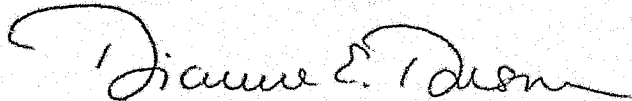
C. Conclusion.

In summary, the parties to this proceeding have responded to the Commission's Remand Order and attempted to address the issues set forth therein. The OCA submits that even consideration of the studies made available since the close of the evidentiary record in August, 1992, unfortunately do not resolve the uncertainty concerning EMF and possible harm to the health of those exposed to such fields. The evidence adduced on remand, therefore, is still not probative of whether a numerical standard should be established for this or any other line. The OCA, therefore, cannot recommend to the Commission that a numerical standard be established based upon this evidentiary record at this time. If, however, the Commission should deem it necessary to do so, it should proceed in accordance with the recommendations of OCA witness Janes.

IV. CONCLUSION

For all of the foregoing reasons, the OCA submits that the record herein does not support the establishment of a health-based numerical edge of right of way standard for the Woodbourne-Heaton line at this time. If, however, the Commission wishes to establish a similarity-based standard for this line, incorporating concepts of prudence as suggested by OCA witness Janes, it should order that a record be developed concerning the levels of EMF generated by newer lines, for which minimization of the electric and magnetic fields have been included in the design.

Respectfully submitted,



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Dated: June 15, 1993
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Appendix A

Summary of OCA Testimony

In this remand proceeding, the Office of Consumer Advocate offered additional testimony by David E. Janes, Vice President of Risk Analysis Corporation, located in McLean, Virginia. Mr. Janes has had over thirty years of experience in analyzing the effects and risks of exposure to ionizing and nonionizing radiation. OCA St. 1 at 1. OCA witness Janes' complete credentials are set forth in his personal resume, which was attached to his initial Direct Testimony, and will not be summarized herein.

The purpose of Mr. Janes' additional testimony was to address the issue of right-of-way standards for the Woodbourne-Heaton line. OCA St. 1B at 2. Mr. Janes first noted that three extensive literature reviews since his testimony in 1991 continue to support the conclusion expressed in his initial testimony, i.e. that weak field effects observed in cellular and animal systems are subtle and often transient or reversible; therefore the connection between such effects and any harm to human health is unclear. OCA St. 1B at 2, n. 2-4.

In addition, Mr. Janes noted Dr. David Rosenbaum's testimony that the epidemiological evidence is suggestive, but far from conclusive, and that it is not even clear that if exposure to power lines increases the risk of cancer, it is the average magnetic field that is the cause. OCA St. 1B at 3, n.5. Mr. Janes

noted four recent epidemiological reports which do not resolve confusion about whether exposure to power frequency magnetic fields affects human health. OCA St. 1B at 4. Mr. Janes testified that the studies report some positive and some negative associations, the most troublesome positive association being that between childhood leukemia and magnetic field exposure in the Swedish residential study. Id. at 4. Mr. Janes concluded that without a viable biophysical mechanism to connect them, the results of the epidemiological, animal and cellular studies are not strong enough to establish a causal link between exposure and harmful effects. Id. at 5. On the other hand, the experimental evidence makes the hypothesis of harmful effects plausible, and the possibility of harm cannot be summarily dismissed. Id.

Mr. Janes proceeded to discuss the policy alternatives for state regulators in the face of uncertain risk, including, inter alia, "similarity-based" standards and a prudent avoidance strategy. Id. at 5-10. He testified further, identifying those states which have adopted those alternatives or have active programs for monitoring results of the research. Id. He also stated that the agencies of the federal government are devoting increasing attention to the potential harm from exposure to EMF's, noting that the Energy Policy Act of 1992 identifies two agencies, the Department of Energy and the National Institute for Environmental Health Science, to lead the five-year \$65 million research effort. Id. at 10.

In Mr. Janes' opinion, a credible health-based standard for power frequency electric and magnetic fields cannot be established at this time because the uncertainty is just too great. Id., at 11. The Florida and New York "similarity-based" standards are engineering standards based upon the average values of electric and magnetic fields from 345 kV lines in New York, rather than the maximum values to which that state's citizens are exposed. Id. at 12. Although he did not endorse the similarity based approach, Mr. Janes noted that the maximum annual average fields on the Woodbourne-Heaton right of way and at the edge of right of way do not exceed the Florida or New York standards. Id. at 13-14, Tables 1 and 2.

Mr. Janes testified that in the absence of evidence on which to base a health standard, the regulatory process could take into account both prudence and similarity concepts. Id. at 14-17. Mr. Janes suggested that prudence principles could be incorporated into the similarity-based approach by using only newer transmission line designs that minimize fields in establishing similarity based standards. Id. at 15. Mr. Janes referred as well to the prudence concepts set forth by Dr. Rosenbaum earlier in the proceeding in his Direct Testimony which should be considered in all siting proceedings. Id. 15-16. Mr. Janes cautioned that if one is required to choose some numerical limit on fields at the edges of rights-of-ways, the standard should be interim because considerable research is underway and much more is planned. Id. at 16. Further, Mr. Janes emphasized that because the present record was

developed for a specific 230 kV line, it should apply to that line only. Id. Also, Mr. Janes emphasized that it needs to be recognized that the standard is not based on avoidance of health effects. Id. It is not possible at this time to state that exposure above a certain electromagnetic field level will have an adverse effect on health or that exposures below a certain level are completely safe. Id.

Mr. Janes concluded that using fields produced by newer 230-kV lines, not necessarily those just in Pennsylvania, to develop a similarity based standard, will incorporate a measure of prudence into the interim standard if developed. Id. at 17.

On cross-examination by Protestants' counsel, Mr. Janes pointed out that he has no information on the need for the Woodbourne-Heaton line. Tr. 1617. Mr. Janes noted that in order to do a risk analysis, one attempts to balance risk and benefits, that he had not looked at the benefit side of the equation at all, and that he would not want to make a judgment on selecting a level without having some understanding of what the benefit was. Tr. 1617-1618.

On cross-examination by PECO's counsel, Mr. Janes stated that he is not recommending that the Commission set a standard for magnetic fields at the edge of the Woodbourne-Heaton right of way, as it is premature to set a health-based standard because of scientific uncertainty about whether fields are harmful. Tr. 1627. In an attempt to be responsive to the Commission's concerns, he identified a process by which the Commission might engage in

choosing a numerical limit if for reasons other than health and safety, it deemed it necessary to do so. That process, as described in his additional direct testimony, would incorporate prudence in the selection of limits by giving weight to newer lines that include field reductions as a design parameter. Tr. 1627.

Appendix B

Statement of Proposed Findings of Fact and Conclusions of Law A.110550, F.055

In addition to the Proposed Findings of Fact set forth in Appendix B, which is attached to the Main Brief of the Office of Consumer Advocate, the OCA proposes the following additional findings of fact support by the references to the record created pursuant to the Commission's remand order of March 26, 1993:

1. Evidence which has become available since the close of the record in this proceeding on February 7, 1992, does not resolve the question of whether exposure to electromagnetic fields affects health. OCA St. 1B at 5.

2. The Swedish residential study by Feychting and Ahlbom reflects an association between magnetic field exposure and childhood leukemia. OCA St. 1B at 4.

3. Although the results of the Feychting and Ahlbom residential study are weakly positive for childhood cancer and leukemia, those results are statistically significant or on the threshold of statistical significance. Tr. 1639-1642.

4. The Swedish residential study by Feychting and Ahlbom, appears to show a negative association between exposure to

magnetic fields and the incidence of adult chronic lymphocytic leukemia. OCA St. 1B at 4.

5. The Swedish residential study shows no association between magnetic field exposure and brain tumors in children, a result which is at variance with an earlier study by Tomenius who observed an increase in those more highly exposed and nearer to power lines. OCA St. 1B at 4.

6. The Swedish residential study, although superior in methodology to the earlier epidemiological studies in certain respects, does not resolve the issue of whether EMF causes adverse health effects. OCA St. 1B at 4; Tr. 1635-1637.

7. A Swedish occupational study by Floderus, et al., reports a positive association between exposure to magnetic fields and the incidence of adult chronic lymphocytic leukemia. OCA St. 1B at 4.

8. The most troublesome of the results of both the old and new studies is the association between exposure to magnetic fields and childhood leukemia, because it appears fairly consistent through the available studies. Tr. 1611-1612.

9. Federal agencies are devoting increasing attention to the potential harm from exposure to power frequency and magnetic fields, in light of the Energy Policy Act of 1992 which designates the Department of Energy and the National Institute of Environmental Health Sciences as responsible for leading a five-year \$65 million effort. OCA St. 1B at 10.

10. In light of the uncertainty resulting from the scientific studies, no numerical health-based standard can be established at this time. OCA St. 1B at 11.

11. It is not possible at this time to state that exposure above a certain electromagnetic field level will have an adverse effect on health or that exposures below a certain level are completely safe. OCA St. 1B at 16.

12. The states which have established edge of right of way standards are Florida and New York. OCA St. 1B at 12.

13. The Florida and New York standards are not health-based standards. OCA St. 1B at 12.

14. In jurisdictions in which a numerical edge of right of way standard has been set, the milligauss level has been set by comparison to existing transmission lines and their average edge of right of way milligauss levels. OCA. St. 1B at 12-13.

15. The New York standard is based upon the average measurements taken on 345 kV transmission lines within New York. OCA St. 1B at 12-13.

16. The witnesses in this remand proceeding who addressed the issue of standards do not recommend the setting of a right of way standard for the Woodbourne-Heaton line at this time. Tr. 1627; PECO Direct on Remand No. 3 at 5; PECO Direct on Remand No. 4 at 12; PECO Direct on Remand No. 5 at 5.

PROPOSED CONCLUSIONS OF LAW

In addition to the Proposed Conclusions of Law set forth in Appendix C to the Main Brief of the Office of Consumer Advocate, the OCA proposes the following conclusion of law:

1. Establishment of specific numerical edge of right of way standards as to the Woodbourne-Heaton transmission line is not supported by the evidence in this proceeding.

59

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VIA FEDERAL EXPRESS

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Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconstructing and Rebuilding of the
Existing 138 kV Line to Operate as a Woodbourne-Heaton
230 kV Line in Montgomery and Bucks Counties - Docket
No. A-110550, F.055

Dear Secretary Alford:

Enclosed for filing with the Commission are the original and nine copies of Philadelphia Electric Company's Initial Brief on Remand in this proceeding. Please mark the Initial Brief on Remand filed as of June 16, 1993, the date indicated on the Federal Express delivery receipt. I have also enclosed an additional copy of this cover letter which I request that you date-stamp and return to me in the envelope provided. As indicated in the attached Certificate of Service, I have served copies of this filing upon Administrative Law Judge Smolen and all parties of record.

Sincerely yours,

Paul R. Bonney

Paul R. Bonney

RECEIVED

JUN 16 1993

PRB/meb

Enclosure

cc: Honorable Herbert Smolen
Parties of Record

DOCUMENT
FOLDER

SECRETARY'S OFFICE
Public Utility Commission

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of :
Philadelphia Electric Company :
Relative to Reconstructing and : Docket No.
Rebuilding of the Existing 138 kV : A-110550, F.055
Line to Operate as a Woodbourne- :
Heaton 230 kV Line in Montgomery :
and Bucks Counties :

INITIAL BRIEF ON REMAND OF
PHILADELPHIA ELECTRIC COMPANY

BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

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June 16, 1993

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JUN 16 1993

SECRETARY'S OFFICE
PUBLIC UTILITY COMMISSION

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of :
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INITIAL BRIEF ON REMAND OF
PHILADELPHIA ELECTRIC COMPANY

BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

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STATEMENT OF THE CASE

This case comes before the Commission yet again so that it can determine whether to reaffirm its February 9, 1990 approval to reconstruct and energize the Philadelphia Electric Company ("PECO") 230 kV Woodbourne-Heaton transmission line.

In the 1991-92 segment of this proceeding, the issue was whether Protestants would be adversely affected by energizing the line. That question was answered by the Commission in its March 26, 1993 Order (pp. 16, 19): Protestants did not even claim to have demonstrated that their health would be adversely affected by electric and/or magnetic fields ("EMF") from the line, and the only adverse land use effect of energizing the line -- Protestants' self-imposed changes in property use because they are concerned about EMF -- does not justify delay in energizing the line.

The purposes of this remand are quite limited. First, the Commission asked the parties to address recent scientific developments, including a Swedish EMF study that received considerable media attention, so the Commission can determine whether to alter its previous conclusions about health. Second, the Commission asked the parties to address, in light of the health findings, whether there should be right-of-way width standards for the line and, if so, what they should be.

Extensive testimony was heard on the recent scientific developments, including the Swedish study. Each of the four science witnesses testified that it still has not been demonstrated that EMF causes health effects.

The record is unequivocal that there is no health basis to establish standards for this line. Administrative Law Judge Smolen (the "ALJ") previously determined that the line meets existing similarity-based magnetic field standards from other states and that the line is consistent with the concept of prudent avoidance. The Commission need not, and should not, allow further delay in energizing the line to establish additional standards. Instead, the Commission should expeditiously reaffirm its approval of this line.

HISTORY OF THE PROCEEDING

This proceeding has been ongoing, in one form or another, since 1989. The events from 1989 to June, 1992 are recounted in the ALJ's Initial Decision (pp. 1-7) and will not be repeated here. Since that time, the following events have occurred:

September, 1992 -- The parties file exceptions and reply exceptions to the Initial Decision.

March 26, 1993 -- The Commission enters its Order remanding the proceeding for further, limited, evidentiary hearings and for consideration of what, if any, right-of-way width standards should exist for the Woodbourne-Heaton line.

April 9, 1993 -- ALJ Smolen issues Prehearing Order setting schedule for exchange of written testimony and for hearings.

May 6, 1993 -- ALJ Smolen issues an Order requiring the parties to exchange formal position statements if they do not intend to file testimony.

May 12, 1993 -- PECO and the OCA submit written direct testimony. Law Bureau and PP&L submit formal position statements, but no testimony. Trial Staff sends a letter stating that it will not submit testimony or a formal position statement because it has instead filed a Petition for Reconsideration with the Commission.

May 14, 1993 -- Protestants submit formal position statement, but no testimony.

May 20, 1993 -- PECO files rebuttal testimony.

May 27 - June 1, 1993: Three days of evidentiary hearings are held.

STATEMENT OF QUESTIONS INVOLVED

The Commission remanded this proceeding for two purposes (March 26, 1993 Order, pp. 22-23):

- "a. receiving evidence and comment regarding all studies of the health effects of magnetic fields which are available on or before the hearings on that evidence commence; and
- "b. determining, in light of findings regarding health effects, what, if any, standards should exist for right-of-way width for the Woodbourne-Heaton 230 kV line."

In its March 26 Order (p. 16), the Commission concluded that the science on EMF is "inconclusive." With regard to the recent scientific developments, the question posed in this remanded proceeding is:

Do recent EMF studies justify any change in the Commission's finding that the science is "inconclusive"?

Answer: Yes. Recent scientific developments have provided additional evidence that EMF does not cause adverse human health effects. From the scientific studies taken as a whole, it can be fairly stated that, after extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects.

The Commission's statement of the "standards" issue incorporates a two-part question:

(a) Whether, in light of the health findings, "any" standard should be developed for the Woodbourne-Heaton line, and (b) if so, what should it be?

Answer: No magnetic field standards or right-of-way width standards should be developed for the Woodbourne-Heaton line. There is no health basis for setting any magnetic field standard, let alone a specific standard for this line. In addition, the only witness who discussed a method for setting a non-health, "similarity-based" standard -- OCA witness Mr. Janes -- categorically stated that he was not recommending that the

Commission actually adopt a similarity-based standard. This line meets or exceeds existing similarity-based magnetic field standards from other states and is consistent with the concept of prudent avoidance. No purpose would be served by delaying energization to enact additional standards.

Finally, during the remand, Protestants made two proposals, leading to another two-part question:

Should the Commission adopt Protestants' proposals that PECO should (a) purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time," or (b) replace the existing overhead line with an underground line?

Answer: No. Protestants' proposals are based on the invalid assumption that health effects have been demonstrated. Moreover, Protestants' proposals are costly and inconsistent with the concept of prudent avoidance.

SUMMARY OF FORMAL POSITION STATEMENTS

Three parties (Protestants, PP&L, and Law Bureau) filed formal position statements rather than testimony.

Protestants' Position Statement

Protestants set forth the following positions in their May 14 position statement:

- It has been demonstrated that magnetic fields "impact" children.
- Because an impact on children has been demonstrated, there is no demonstrated acceptable level of magnetic field exposure. The Commission should therefore require that magnetic fields from the Woodbourne-Heaton line are undetectable at maximum loading.
- Because an impact on children has been demonstrated, PECO should be required to purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time."
- Because an impact on children has been demonstrated, PECO should be required to underground the Woodbourne-Heaton line.

Pennsylvania Power & Light's Position Statement

PP&L set forth the following positions in its May 12 position statement:

- It has not been demonstrated that magnetic fields are harmful.
- No right-of-way width standards should be enacted for this line. There is no health basis for such standards, and a "similarity-based" standard would not address public concerns.
- The Commission should allow the Woodbourne-Heaton line to be energized.
- In addition, the Commission should take steps to mandate that Pennsylvania utilities follow a comprehensive EMF policy. (PP&L's proposed policy is described at pages 12-18 of its Exceptions filed in the first segment of this proceeding.)

Law Bureau's Position Statement

Law Bureau set forth the following positions in its May 12 position statement:

- There is no conclusive evidence that EMF is a hazard to humans.

- There is no health basis to establish right-of-way width standards, and thus none should be enacted for this line.
- The Commission should evaluate transmission lines on a case-by-case basis to determine whether they are consistent with the concept of prudent avoidance.
- The Woodbourne-Heaton line is consistent with the concept of prudent avoidance, and it should therefore be energized.

SUMMARY OF TESTIMONY

Seven witnesses testified in these remanded hearings. Mr. David Janes appeared for OCA. PECO presented the testimony of Dr. Richard Bockman, Dr. Edward Gelmann, Dr. Philip Cole, Mr. Ronald Oedemann, Mr. Donald Frieman, and Mr. Charles Boeggeman.

Testimony of Mr. David Janes

Mr. David Janes addressed recent scientific developments on EMF and reiterated his prior opinion that, while biological effects of EMF exposure have been demonstrated, "The connection between these effects and any harm to human health is unclear." OCA Statement No. 1B, p. 2. He stated that this conclusion is supported by several recent extensive reviews of the EMF science. Id. On cross-examination, Mr. Janes stated that his conclusion that the science is unclear "is perfectly consistent with the statement that there has not been a demonstrable health hazard." N.T. 1626.

Mr. Janes addressed the Swedish residential study. He stated that, after reviewing the results of the Swedish study and other recent epidemiology studies, he still finds the state of the epidemiologic research to be "confused." OCA Statement No. 1B, p. 4. He also stated the results of the Swedish study are at variance with an earlier Swedish study, that the results of the study must be interpreted with caution, and that the Swedish study contains "troublesome" results. Id. On cross-examination, Mr. Janes explained that by "troublesome" he meant that the study contains observations that need to be looked at in more detail. N.T. 1612-13.

In his direct testimony, Mr. Janes reiterated certain "prudent avoidance" measures that he believes should be

incorporated into the planning of new transmission lines. OCA Statement No. 1B, pp. 5-11, 15-16.

Mr. Janes also addressed the question of whether right-of-way width standards should be developed and adopted for this line. First, he stated that a health-based magnetic field standard cannot be established. OCA Statement No. 1B, p. 11. The existing magnetic field standards are not health-based, but rather are "similarity-based". Id., pp. 11-12. The Woodbourne-Heaton line meets all existing electric and magnetic field standards. Id., p. 13.

Mr. Janes then described a method that could be used to set a similarity-based magnetic field standard "if one is required to choose some numerical limit." Id., pp. 14-17. On cross-examination, however, Mr. Janes categorically stated: "I am not recommending that the Commission set a standard for magnetic fields at the edge of the Woodbourne-Heaton right-of-way." N.T. 1627.

Testimony of Dr. Richard Bockman

Dr. Richard Bockman is a medical doctor, a researcher, and a teacher in the medical fields of endocrinology and immunology. PECO Direct on Remand No. 3, p. 1. Dr. Bockman testified regarding 12 new studies and scientific reviews in the areas of endocrinology and immunology. Id., pp. 1-5. Dr. Bockman's testimony from those recent studies and reviews can be summarized as follows:

- There remains no evidence that humans can perceive power frequency magnetic fields at levels associated with transmission lines. Id., p. 2.
- Recent developments on calcium metabolism "are consistent with my previous conclusion . . . that 60 Hz electric and/or magnetic fields do not modulate cell function or Endocrine system function by altering calcium metabolism." Id., p. 2.
- "I continue to conclude that the rat melatonin studies do not provide a basis for concluding that power frequency fields lead to adverse effects on human biologic rhythms." Id., p. 3.

● Just as with previous research, recent research on reproduction and development has not shown adverse effects of EMF exposure. Id., pp. 3-4.

● Recent research on cells from the immune system has shown mixed results. Recent immune system research using intact animals showed no effect on host immune response. Id., p. 4.

● Recent reviews support Dr. Bockman's conclusion that no endocrine or immune effects of exposure to EMF have been demonstrated. Id., pp. 4-5.

Dr. Bockman's overall conclusion from the scientific developments, including the new research, is (Id., p. 5):

"Research evidence presented to date appears to reject the hypothesis that acute or prolonged exposure to EMF equivalent or several times stronger than fields experienced under high-voltage AC transmission lines results in biologic disruption of endocrine or immunologic systems."

With regard to the question of standards, Dr. Bockman concluded that: "I see no reason from the Endocrine or Immune science for setting such standards." Id., p. 5.

Cross-examination of Dr. Bockman was limited to a series of questions about the recent calcium research, especially research involving single-celled organisms known as "diatoms." N.T. 1539-47. Dr. Bockman generally concluded that the diatom studies "are far too indirect . . . and don't measure what we are really interested in, which is calcium. And when we do measure calcium, we don't see the change." N.T. 1546.

Testimony of Dr. Edward Gelmann

Dr. Edward Gelmann is a medical doctor, researcher, and teacher, specializing in medical oncology. PECO Direct on Remand No. 5, p. 1. Dr. Gelmann testified regarding 13 new studies and scientific reviews related to molecular genetics, cellular biology, and carcinogenesis. Id., pp. 1-5.

Dr. Gelmann discussed several new mutational analyses (tests that show whether a permanent change has occurred in the structure of the DNA molecule), which reported that exposure to power frequency fields had no effect on mutations. Id., p. 2. He discussed new chromosome studies (tests to determine whether

there are breaks or damage to the chromosomes), which also showed no effect from exposure to EMF. Id., pp. 2-3. He discussed a number of animal studies that addressed the question of whether power frequency fields act as tumor promoters, either by themselves or in combination with chemical agents. These studies showed no increase in tumor promotion from exposure to EMF. Id., pp. 3-4. Dr. Gelmann also briefly discussed several new reviews of the EMF research that conclude that adverse human health effects of exposure to EMF have not been demonstrated. Id., pp. 4-5. Dr. Gelmann's conclusion from these new studies was:

"[I]t is still my opinion that the scientific research provides no basis to conclude that power frequency fields cause, promote, or otherwise contribute to the development of cancer or other adverse health effects."

Id., p. 5.

With regard to setting edge of right-of-way standards, Dr. Gelmann testified that "I see no scientific or medical basis to develop a right-of-way width standard." Id.

On cross-examination, Dr. Gelmann was asked a series of questions about studies involving "magnetites." N.T. 1702-09, 1716. He testified that he was not familiar with a specific magnetite study that had been reported the previous day in the Philadelphia Inquirer, N.T. 1704, that he has reviewed studies on EMF and magnetites, N.T. 1705, that no attempt was made to remove magnetites from the cells and animals used in the studies that he relies upon, N.T. 1716, and that the presence of magnetite has nothing to do with the DNA or carcinogenesis. N.T. 1708, 1716.

During cross-examination Dr. Gelmann stated that, while his written testimony concluded that there is no basis to believe that EMF causes cancer, it is also his opinion that "there is a strong basis to conclude that fields do not cause cancer." N.T. 1710-15 (emphasis added).

Testimony of Dr. Philip Cole

Dr. Philip Cole is a medical doctor, a professor, and a researcher in the field of epidemiology. PECO Direct on Remand

No. 4, p. 1. Dr. Cole testified regarding 16 new studies and scientific reviews in the field of epidemiology. Id., pp. 1-12.

Dr. Cole discussed several new studies and reviews on the epidemiology of childhood cancer, including the recent Swedish residential study by Feychting & Ahlbom. Id., pp. 2-7. With regard to the Swedish residential study, Dr. Cole stated that the authors of the Swedish study have recently published additional data that show that Swedish children who lived near a transmission line had cancer at the same rate as Swedish children who did not live near a transmission line. Id., p. 3. He stated that the study is negative for childhood brain cancer and for "all childhood cancers," and weakly positive for childhood leukemia. Id., p. 4.

Dr. Cole then conducted a detailed examination of the "weakly positive" results on childhood leukemia to determine whether the Swedish residential study supports a conclusion that magnetic fields cause childhood leukemia. He stated that there are at least four reasons from the data that argue against such a conclusion: (1) the study is very small for childhood leukemia -- only 38 cases of that cancer were included in the Swedish study; (2) children who had lived in the transmission corridor for the largest percentage of their lives had the smallest risk of leukemia; (3) the data exhibit inconsistent patterns that would not be seen if EMF were a cause of cancer; and (4) there is no association between childhood leukemia and actual magnetic field measurements in the Swedish study. Id., p. 4.

Dr. Cole concluded that, because of inconsistencies in the data, the data in the Swedish study regarding childhood leukemia support a null or negative interpretation as easily as a positive interpretation. Dr. Cole then referred to two recent reviews of the EMF epidemiologic research, conducted respectively by the National Radiological Protection Board of the United Kingdom and the Oak Ridge Associated Universities. Both of these reviews also concluded that the Swedish residential study does not prove that exposure to EMF causes childhood leukemia. Id., pp. 5-6.

Dr. Cole also discussed a recent Danish study and a recent study from Ohio, and stated his conclusion with regard to childhood cancers (Id., p. 7):

"There is no demonstrated risk of childhood cancer when actual electric or magnetic fields were measured. When surrogates such as the wire code, or the estimated fields used in the Swedish study, were used in the childhood studies, the data have shown a pattern of mixed results between weak positive and negative outcomes. This is not the pattern of cause and effect. I conclude that the epidemiologic evidence on EMF, when viewed as a whole, provides no persuasive scientific support for the hypothesis that EMF causes cancer in children."

Dr. Cole then addressed recent research on EMF and adult cancers. He noted that there have been several recent studies that, because of limits in their method, add little to our state of knowledge. Id., pp. 8-9.

One recent study, however -- the occupational study from California by Sahl, et al. -- provides substantial new information. Dr. Cole stated that this study "essentially redefines the quality level for research in this field." Id., p. 9. The Sahl study incorporates a major improvement in exposure assessment in that it used the "main approach to exposure assessment," actual measurements of magnetic fields in the workplace. Id. It is a "distinct improvement" over previous studies in that it consists of four separate investigations and thus addresses the question of whether EMF causes cancer using a variety of methods. Id., p. 10. The study is very large: more than 36,000 utility workers from Southern California Edison were studied, and over 700 cases of cancer were included in the study. Id. Finally, the depth and detail of analysis is more comprehensive than any previous EMF study. Id. The results of the study are consistently negative for all four separate investigations, for all forms of cancer, and for all measures of magnetic field exposure -- even among those workers who had significantly higher exposures to magnetic fields. Id., pp. 10-11.

Dr. Cole then stated his conclusion with regard to the studies on EMF and adult cancer (Id., p. 11):

"These studies show weakly positive to zero to inverse associations. The studies that use the most acceptable design consistently have found no association between EMF and cancer. The recent Sahl study is a substantial improvement in study design and method and it is uniformly negative. I conclude that this body of studies does not support the hypothesis that EMF is associated with adult cancer, and that the best-designed and conducted studies provide strong support against that hypothesis."

Dr. Cole then stated his overall conclusion as to the state of the epidemiologic research on EMF and cancer (Id.):

"Taken together, the epidemiologic reports fail to demonstrate any strong or consistent pattern of association between EMF and cancer in human beings. The summation can only be that, to date, there is no demonstrated relationship between EMF and cancer in human beings."

Dr. Cole concluded his testimony by stating that the epidemiologic research provides no reason to set any magnetic field standards for this line. Moreover, they do not provide an effective basis for setting such a standard. Id., p. 12.

On cross-examination, Dr. Cole was asked additional questions about the Swedish residential study. He testified that: (1) children who had lived near transmission lines had leukemia at the same rate as children who had not lived near transmission lines, N.T. 1684; (2) generally speaking, the Swedish study is a large, well-done study, but it is nonetheless very small for the only positive result in that study (childhood leukemia), N.T. 1635-36, 1676-77, 1690-92; (3) the exposure assessment method used in the Swedish residential study provides a more detailed, but not necessarily a more accurate, estimate of past exposure, N.T. 1636-38; (4) the study contains statistically significant results for childhood leukemia, N.T. 1639-43, but that fact is of minimal significance, N.T. 1677-78 -- the question is whether those data support a cause-effect interpretation, and they do not because, among other things, the data do not exhibit a dose-response relationship, N.T. 1682-87; (5) that Dr. Cole interprets the conclusions of the Oak Ridge

Associated Universities with regard to the Swedish study ["not sufficiently compelling to alter" prior conclusions] as being consistent with the statement that the Swedish study is "inadequate to cause a change of position," N.T. 1664-65; and (6) that Dr. Cole interprets the conclusion of the National Radiological Protection Board with regard to the Swedish residential study [recent studies, including the Swedish study, ". . . do not establish that exposure to EMF is a cause of cancer, although they provide weak evidence to suggest the possibility exists"] as follows:

"My interpretation is based on the idea that the language used here is the weakest possible language consistent with not making a categorical statement as befits good scientists. They say, in a way uncharacteristic of the chief author of that report, 'suggests the possibility.' That is in my judgement a double qualification and it is intended to imply the lowest level of credibility possible. And therefore I interpret it to mean 'unlikely in the extreme.'"

N.T. 1670-71 (internal quotation marks added for clarity).

Dr. Cole was also asked to compare the exposure assessment protocols used in two studies on adult cancer: the Swedish occupational study by Floderus, et al., and the Californian occupational study by Sahl, et al. Dr. Cole testified that the exposure assessment method used in the Sahl study is vastly superior to that used in the Swedish occupational study. N.T. 1646-51.

Dr. Cole also made the following statements regarding the Sahl occupational study: (1) the study does not contain data on age-specific relative risks, N.T. 1652, but does contain data on age-adjusted relative risks. N.T. 1789; (2) the study does not contain data on age-adjusted standard mortality ratios, N.T. 1652, but the design of the study -- which Dr. Cole characterized as "superb" -- does not require such data since the focus of the analysis is on the case-control components of the study, N.T. 1679-81; (3) Dr. Jack Sahl is an employee of an electric utility, N.T. 1654, but the employment status of the authors of a study is

something to which Dr. Cole pays no attention, N.T. 1678; and (4) the individual reputation of researchers is an important element in interpreting a study, and Dr. Sander Greenland, one of the authors of the Sahl study, is "one of the most well known and well respected epidemiologic analysts in the world." N.T. 1679.

Finally, Dr. Cole was asked to compare his conclusions for, respectively, EMF and childhood cancer, EMF and adult cancer, and EMF and all cancers. N.T. 1654-70. Dr. Cole explained that, with regard to childhood cancer, he intended to express the idea that "the causal argument, which is in effect the whole argument," has now been excluded, N.T. 1661, while for adult cancers, he intended to express the idea that, because the available information is lesser in quantity and quality, more research might be appropriate -- although recent high-quality research such as the Sahl study may have eliminated the need for more research. Id. With regard to his overall conclusions on EMF and cancer, Dr. Cole stated:

"[M]y summary is that the available evidence now, and particularly in the last year, run counter [to the hypothesis that EMF is a cause of cancer]. That is, we are not only showing that electromagnetic fields are not shown to cause cancer, but the available evidence now shows that they do not [cause cancer]. That is, the contrary evidence is now in the affirmative." N.T. 1656 (emphasis added).

"[I]n the last year or so, that is, during the period of time in which these studies [Sahl and the two Swedish studies] have appeared, the evidence against the hypothesis has mounted. And when I say against the hypothesis, I mean not in the direction of the null state but, rather, in the direction of an affirmation of the absence of an effect. Not merely that there is no evidence of an effect, but we now have evidence that there is no effect. These studies are, in my judgement, inconsistent with the possibility that EMF causes cancer in human beings." N.T. 1667 (emphasis added).

"[T]he statement that EMFs have not been demonstrated to be carcinogenic is a statement of enormous power. And it is a statement of enormous power because the opportunity for EMFs to have been shown to be carcinogenic is enormous. It is not one study. In other words, we now have a substantial body of evidence to the effect that EMFs are not carcinogenic." N.T. 1670.

Testimony of Mr. Ronald Oedemann

Mr. Ron Oedemann is the Lead Project Engineer for the Woodbourne-Heaton line. In his direct testimony, Mr. Oedemann described the right-of-way within which the Woodbourne-Heaton line was constructed: it is an easement approximately 60 feet wide, contained within a wider, existing utility corridor. This existing utility corridor has a number of ongoing or recent utility uses other than the Woodbourne-Heaton line. The wider, existing utility corridor is approximately 100 feet wide at its narrowest points and 995 feet wide at its widest points. For a small portion of the length of the line, the edge of the Woodbourne-Heaton right-of-way is coterminous with the edge of the utility corridor. At these coterminous points, there are no residential uses abutting the utility corridor. For the entire length of the Woodbourne-Heaton line, this wider utility corridor provides a de facto right-of-way for the Woodbourne-Heaton line that is wider than the nominal 60 foot right-of-way. PECO Direct on Remand No. 1, pp. 1-3.

On cross-examination, Mr. Oedemann testified that the areas in which the right-of-way and the wider utility corridor are coterminous occur at three distinct points along the line. N.T. 1582. He clarified that the shortest distance from the centerline of the transmission line to the edge of a residential property is approximately 40 feet. N.T. 1482-83.

In his rebuttal testimony, Mr. Oedemann provided information regarding the Protestants' suggestion that an underground line should be constructed to replace the existing overhead Woodbourne-Heaton line. Constructing an underground line would take approximately 2 years after commencement of engineering, and would cost a minimum of approximately \$ 38.5 million. PECO Rebuttal on Remand No. 1, p. 1.

On cross-examination, Mr. Oedemann explained that the minimum cost of \$38.5 million was based upon the shortest possible route between the two substations. N.T. 1587. He also explained that the \$38.5 million figure would increase when costs

are added for the additional maintenance needed for an underground line. N.T. 1587.

Testimony of Mr. Donald Frieman

Mr. Don Frieman is the Manager of Real Estate for PECO. In his rebuttal testimony, he addressed Protestants' proposal that PECO should purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time." He stated that the minimum fair market value of the properties meeting that definition is over \$160 million. In addition, Mr. Frieman stated that the proposal could not be adopted under current law because PECO cannot condemn residences or land within a curtilage of residences (i.e., 100 meters). PECO Rebuttal on Remand No. 3, pp. 1-2.

On cross-examination, Mr. Frieman stated that his estimate of \$160 million was based on the free market value of all 314 properties along the route of the line, N.T. 1592, and that he had not attempted to estimate the free market value for "subgroups" of the property along the line, such as residential properties only, N.T. 1592, Protestants' property only, N.T. 1593, properties identified according to some milligauss criterion other than "all properties any portion of which would be within levels above one milligauss more than 5% of the time," N.T. 1607, or only properties used by children. N.T. 1607.

Also on cross-examination, Mr. Frieman explained that the \$160 million must be considered a minimum that likely would be increased by other factors, such as the effect of time in acquiring property, N.T. 1594, costs of condemnation, N.T. 1595, relocation, N.T. 1596, and demolition of existing structures. N.T. 1597.

In response to questions regarding what the market value of this property to PECO would be if PECO were required to purchase it, Mr. Frieman stated that, since the property would in that case be used as a utility corridor rather than for its current industrial, commercial, and residential uses, there would be a dramatic decrease in the market value. N.T. 1597-1605. He stated

that there are substantial carrying costs, including taxes, involved with owning property and that the net effect on PECO of owning such a wide utility corridor would be negative. N.T. 1606.

Mr. Frieman also testified on cross-examination that he agreed with the testimony of Mr. Van Dyke from the previous hearings in this proceeding (PECO Rebuttal Statement No. 5, p. 15) that energizing the line would not decrease market value of nearby properties. Under the Protestants' proposal to have PECO purchase these properties, however, the use of the land would be changed to use as a utility corridor, and in that case there would be a substantial decrease in the market value of land along the line. N.T. 1600-05.

Testimony of Mr. Charles Boeggeman

Mr. Charles Boeggeman is an electrical engineer and Chairman of PECO's EMF Task Force. In his direct testimony, he testified that the fields from the Woodbourne-Heaton line are well below existing similarity-based magnetic field standards from New York and Florida. He also stated that the existing right-of-way for the Woodbourne-Heaton line is consistent with the concept of prudent avoidance because the field levels at the edge of the right-of-way are low, and because the right-of-way itself exists within a wider, existing utility corridor. The fields at the edge of the wider, existing utility corridor are thus even lower than at the edge of the Woodbourne-Heaton right-of-way. PECO Direct on Remand No. 2, pp. 3-4.

In his rebuttal testimony, Mr. Boeggeman stated that PECO generally supports many of the prudent avoidance measures identified by Mr. Janes and practices them in siting new facilities, but that those prudent avoidance measures are not related to the issue of whether magnetic field standards should exist for the constructed Woodbourne-Heaton line. Mr. Boeggeman also pointed out that there are many problems with and unanswered questions about the method Mr. Janes proposed for setting magnetic field standards. PECO Rebuttal on Remand No. 2, pp. 2-3.

Mr. Boeggeman also testified that the Protestants' proposal to have PECO purchase property is not consistent with the concept of prudent avoidance. First, the authors of the concept of prudent avoidance evaluated this idea and concluded that "moving in order to get away from existing lines goes beyond what we would consider prudent." Id., p. 4. Second, the cost associated with the proposal is not a "small or modest" cost, and only measures that can be achieved with small or modest cost are consistent with prudent avoidance. Id.

Finally, Mr. Boeggeman testified that the Protestants' proposal to replace the existing overhead Woodbourne-Heaton line with an underground line is not consistent with the concept of prudent avoidance because the \$38.5 million cost for that proposal is not "small or modest." Id.

On cross-examination, Mr. Boeggeman testified that the same standards are used when conducting a prudent avoidance evaluation for an existing line and a proposed line. N.T. 1564. He also testified that he had no opinion as to whether the Commonwealth Court's Order in this matter meant the Woodbourne-Heaton line should be considered an existing line. N.T. 1556-64.

Mr. Boeggeman also testified that in determining the costs of both of Protestants' proposals (purchasing property and burying the line) he accepted the costs estimated by Mr. Frieman and Mr. Oedemann in their respective testimony and did not attempt to adjust those figures. N.T. 1564-73.

Mr. Boeggeman was also asked about the New York magnetic field standards. He confirmed that the New York similarity-based standard does apply to 230 kV lines and that the Woodbourne-Heaton line does meet the New York standard. N.T. 1550-59, 1575-78.

SUMMARY OF ARGUMENT

Recent scientific developments have provided additional evidence that EMF does not cause adverse human health effects. The recently released Swedish residential study does not support a conclusion that EMF is a cause of cancer. From the scientific studies taken as a whole, it can be fairly stated that, after extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects.

No magnetic field standards or right-of-way width standards should be developed for the Woodbourne-Heaton line. There is no health basis for setting a magnetic field standard. In addition, the only witness who discussed a method for setting a non-health, "similarity-based" standard -- OCA witness Mr. Janes -- categorically stated that he was not recommending that the Commission actually adopt a similarity-based standard. This line meets or exceeds existing similarity-based magnetic field standards from the two states -- New York and Florida -- that have adopted such standards, and the line is consistent with the concept of prudent avoidance. No purpose would be served by delaying energization of this line to enact additional standards.

Protestants' proposals to have PECO purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time" or to replace the existing overhead Woodbourne-Heaton line with an underground line are based on the invalid assumption that health effects have been demonstrated. Moreover, Protestants' proposals are costly and inconsistent with the concept of prudent avoidance.

ARGUMENT

I. The Commission Should Conclude That, After Extensive Scientific Investigation, It Has Not Been Demonstrated That EMF Causes Adverse Human Health Effects

A. The Swedish Residential Study Does Not Support a Conclusion That EMF Causes Childhood Cancer

While the Swedish residential study by Feychting and Ahlbom is only one of many EMF studies discussed in this remand, the Commission stated its desire to have that study examined in this proceeding. March 26 Order, p. 21. PECO will thus address it separately in this section.

Two witnesses discussed the Swedish residential study: OCA witness Mr. Janes and PECO witness Dr. Cole.

It should be remembered that Mr. Janes is a biophysicist, N.T. 371-72, not an epidemiologist. In fact, in the first hearings in this proceeding Mr. Janes did not even discuss the epidemiologic research, instead deferring on epidemiology issues to the OCA's other witness, Dr. Rosenbaum. OCA Statements No. 1 and No. 2 (August, 1991).¹

Mr. Janes stated that, after reviewing the results of the Swedish study and other recent epidemiology studies, he still finds the state of the epidemiologic research to be "confused." OCA Statement No. 1B, p. 4. He also stated that the results of the Swedish study are at variance with an earlier Swedish study and must be interpreted with caution. *Id.* Mr. Janes stated that the Swedish study contains "troublesome" results, by which he means that the study contains observations that needs to be looked at in more detail. *Id.*, N.T. 1612-13.

Dr. Cole is a medical doctor who also holds a doctorate in Public Health. He is Professor and Chairman of Epidemiology at the University of Alabama at Birmingham. He has provided epidemiologic assistance to agencies such as the International Agency for Cancer Research, and has received prestigious

¹ Dr. Rosenbaum did not appear in these remanded hearings.

international honors for his epidemiologic research. He has been a cancer epidemiologist for over 25 years and published more than 130 scientific papers reporting the results of his own epidemiological research. PECO Rebuttal Statement No. 2 (November, 1991), pp. 1-4.

Dr. Cole's analysis of the Swedish residential study is set out at length in the Summary of Testimony section of this brief. That Summary demonstrates that the Swedish study is null or negative for adult cancer, for childhood brain cancer, and for "all childhood cancers," and has one weakly positive result -- for childhood leukemia. Dr. Cole reviewed the data on childhood leukemia in detail to determine whether they support a conclusion that EMF is a cause of childhood leukemia, and stated, among other things:

- The Swedish study is very small for childhood leukemia. Only 38 cases were included in the study. PECO Direct on Remand No. 4, p. 4.

- In the Swedish residential study, children who had lived near transmission lines had leukemia at the same rate as children who had not lived near transmission lines. N.T. 1684.

- Children who had lived in the transmission corridor for the largest percentage of their lives had the smallest risk of leukemia. PECO Direct on Remand No. 4, p. 4.

- The National Radiological Protection Board of the United Kingdom and the Oak Ridge Associated Universities reviewed the Swedish study and concluded that it does not prove that exposure to EMF causes childhood leukemia. Id., pp. 5-6.

After reviewing the Swedish residential study and other recent research on EMF and childhood cancer, Dr. Cole concluded (Id., p. 7):

"There is no demonstrated risk of childhood cancer when actual electric or magnetic fields were measured. When surrogates such as the wire code, or the estimated fields used in the Swedish study, were used in the childhood studies, the data have shown a pattern of mixed results between weak positive and negative outcomes. This is not the pattern of cause and effect. I conclude that the

epidemiologic evidence on EMF, when viewed as a whole, provides no persuasive scientific support for the hypothesis that EMF causes cancer in children."

PECO submits that the only finding that can be made on this record is that the Swedish residential study does not support a conclusion that EMF causes childhood cancer.

B. After Extensive Scientific Investigation, It Has Not Been Demonstrated That EMF Causes Adverse Human Health Effects

PECO believes that the overall science testimony in this remanded proceeding should persuade the Commission to change from its prior conclusion that the science is "inconclusive" to a conclusion that, after extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects.

Dr. Gelmann, Dr. Bockman, and Dr. Cole each stated that it has not been demonstrated that EMF causes adverse human health effects. PECO Direct on Remand No. 3, p. 5; PECO Direct on Remand No. 4, p. 11; PECO Direct on Remand 5, p. 5. Even the OCA's witness Mr. Janes stated that his conclusion that the science is "unclear" "is perfectly consistent with the statement that there has not been a demonstrable health hazard." N.T. 1626.

Moreover, it is important to recognize that the record evidence shows that an additional statement can be made: there is reason to believe that EMF does not cause adverse human health effects. Dr. Gelmann stated: "there is a strong basis to conclude that fields do not cause cancer." N.T. 1710-15 (emphasis added). Likewise, Dr. Bockman concluded:

"Research evidence presented to date appears to reject the hypothesis that acute or prolonged exposure to EMF equivalent or several times stronger than fields experienced under high-voltage AC transmission lines results in biologic disruption of endocrine or immunologic systems."

PECO Direct on Remand No. 3, p. 5.

Dr. Cole provided the most extensive discussion of this issue. He described the recent epidemiologic research, including the "superb" new occupational study from California by Sahl, et

al., which he stated "essentially redefines the quality level for research in this field." PECO Direct on Remand No. 4, p. 9. His conclusions from that research are set out at length:

"[M]y summary is that the available evidence now, and particularly in the last year, run counter [to the hypothesis that EMF is a cause of cancer]. That is, we are not only showing that electromagnetic fields are not shown to cause cancer, but the available evidence now shows that they do not [cause cancer]. That is, the contrary evidence is now in the affirmative." N.T. 1656 (emphasis added).

"[I]n the last year or so, that is, during the period of time in which these studies [Sahl and the two Swedish studies] have appeared, the evidence against the hypothesis has mounted. And when I say against the hypothesis, I mean not in the direction of the null state but, rather, in the direction of an affirmation of the absence of an effect. Not merely that there is no evidence of an effect, but we now have evidence that there is no effect. These studies are, in my judgement, inconsistent with the possibility that EMF causes cancer in human beings." N.T. 1667 (emphasis added).

"[T]he statement that EMFs have not been demonstrated to be carcinogenic is a statement of enormous power. And it is a statement of enormous power because the opportunity for EMFs to have been shown to be carcinogenic is enormous. It is not one study. In other words, we now have a substantial body of evidence to the effect that EMFs are not carcinogenic." N.T. 1670.

PECO recognizes that it is not false to say that the science on EMF is unclear, uncertain, or inconclusive. PECO submits, however, that the public interest requires that the Commission give the public more information than can be conveyed by use of those summary adjectives which, frankly, can make it appear as though nothing much is known about EMF. The extensive record developed in this proceeding demonstrates quite convincingly that such a message should not be sent to the public. In fact, as Dr. Cole stated, an enormous amount is known about whether EMF causes adverse human health effects. N.T. 1670. PECO therefore requests that the Commission alter its characterization of the science to make it clear to the public that, while it is fair to say that the science on EMF is "inconclusive," it is also fair to say that

"after extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects."

II. The Commission Should Not Set Right-of-Way Width Standards for the Woodbourne-Heaton Line

A. There Is No Health or Scientific Basis for Developing or Adopting Right-of-Way Width Standards

All four science witnesses concluded that there is no health or science basis for developing or adopting right-of-way width standards for the Woodbourne-Heaton line.

Mr. David Janes:

"The uncertainties are just too great [to establish a health based standard]". OCA Statement No. 1B, p. 11 (emphasis added).

Dr. Richard Bockman:

"Since it is my opinion that power frequency electric and/or magnetic fields several times stronger than those experienced under transmission lines do not disrupt the Endocrine or Immune systems, I see no reason from the Endocrine or Immune science for setting such standards." PECO Direct on Remand No. 3, p. 5 (emphasis added).

Dr. Edward Gelmann:

"I see no scientific or medical basis to develop a right-of-way width standard." PECO Direct on Remand No. 5, p. 5 (emphasis added).

Dr. Philip Cole:

"The epidemiologic research thus provides no reason to set any standards related to this line. Moreover, it does not provide any effective basis for setting such a standard." PECO Direct on Remand No. 4, p. 12 (emphasis added).

PECO respectfully submits that the record evidence in this proceeding allows only one conclusion: a health-based magnetic field standard cannot be developed for this line.

B. The Commission Should Not Set a Similarity-Based Magnetic Field Standard for The Woodbourne-Heaton Line

OCA witness Mr. Janes discussed a process for developing a non-health, similarity-based magnetic field standard that he

stated could be used "if one is required to choose some numerical limit." OCA Statement No. 1B, pp. 16-17. PECO submits that the Commission need not -- and should not -- attempt to use Mr. Janes' process to develop a similarity-based magnetic field standard for the Woodbourne-Heaton line.

First, Mr. Janes categorically stated that, while he had discussed a method for setting a similarity-based standard, he is not recommending that the Commission should actually use this method to set a magnetic field standard for the Woodbourne-Heaton line:

"I am not recommending that the Commission set a standard for magnetic fields at the edge of the Woodbourne-Heaton right-of-way." N.T., pp. 1626-27 (emphasis added).

Second, the ALJ previously found that the Woodbourne-Heaton line meets the only existing similarity-based magnetic field standards, the New York and Florida standards. I.D., pp. 124-25. This was confirmed on the record in these remanded hearings. PECO Direct on Remand No. 2, pp. 2-3, N.T. 1550-59, 1570-78. Moreover, the ALJ already determined that the fields from this line are in the same range as magnetic fields from other 230 kV transmission lines in Pennsylvania and elsewhere in the United States. I.D., p. 125.

Third, this line has been evaluated under a broad range of regulatory and policy criteria. As discussed in PECO's previous briefs and Exceptions in this proceeding, this line meets the Commission's existing standards for approval of a transmission line. E.g., PECO Initial Brief, pp. 17-18; PECO Exceptions, pp. 4-8. The ALJ already has determined that the design and route of this line are consistent with the concept of prudent avoidance. I.D., pp. 127-28. In this remanded proceeding, there is unrebutted testimony that the right-of-way width for this line is consistent with the concept of prudent avoidance because the Woodbourne-Heaton right-of-way results in low field levels at the edge of the right-of-way and because the Woodbourne-Heaton right-of-way is contained within a wider, existing utility corridor.

The fields at the edge of the wider, existing utility corridor are even lower than at the edge of the Woodbourne-Heaton right-of-way. PECO Direct on Remand No. 2, pp. 3-4.

Fourth, there is un rebutted testimony that any attempt to actually utilize Mr. Janes' process to develop a similarity-based standard would be complex and fraught with problems. PECO Rebuttal on Remand No. 2, p. 2-3. Moreover, as explained in PECO's Exceptions, any standard-setting procedure would have similar complexities and problems. PECO Exceptions, pp. 11-18. Other states have rejected development of similarity-based standards, in part due to these complexities and problems. Id.

Fifth, the Commission has recently approved other transmission lines in which EMF issues were raised -- and it has done so without adopting magnetic field or right-of-way width standards specific to those lines. E.g., In Re Pennsylvania Power & Light Company, Docket No. A-110500F040 (April 15, 1991); Application of West Penn Power Company, Docket No. A-111250F035 (March 9, 1992). There is no reason that the Woodbourne-Heaton line should be treated any differently.

In short, the Commission should not undergo yet another lengthy and costly proceeding to set similarity-based standards for the Woodbourne-Heaton line -- especially given that the line meets or exceeds existing similarity-based standards, that the fields from this line are in the same range as magnetic fields from other 230 kV transmission lines, and that the design, route, and right-of-way width of the Woodbourne-Heaton line are consistent with the concept of prudent avoidance.

III. The Commission Should Reject the Protestants' Proposals

A. The Commission Should Reject the Protestants' Proposal To Have PECO Purchase Properties

In their May 14 position statement, Protestants propose that PECO should purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time." The Commission should reject this proposal.

First, Protestants' proposal is based on the invalid assumption that health effects of EMF have been demonstrated. Since such effects have not been demonstrated, there is no justification for such a proposal.

Second, the proposal would be very costly -- over \$160 million at a minimum. PECO Rebuttal on Remand No. 3, p. 1; N.T. 1594-97. ² (The estimated total cost for the Woodbourne-Heaton line is \$19.8 million. PECO Direct No. 1 [August, 1991], p. 7).

Third, there was unrebutted testimony that this proposal is not consistent with the concept of prudent avoidance. The authors of the concept of prudent avoidance have stated that: "[M]oving in order to get away from existing lines goes beyond what we would consider prudent." PECO Rebuttal on Remand No. 2, p. 4. Moreover, the proposal is inconsistent with the concept of prudent avoidance because the \$160 million cost of the proposal goes well beyond the "small or modest" costs that can be considered under the concept of prudent avoidance. *Id.*

Fourth, for the portion of the property which is residential, PECO would not be able to exercise eminent domain due to the statutory restrictions on condemnation of residences and land within a 100 meter curtilage. This proposal thus would require legislation to permit taking of homes by electric utilities. PECO Rebuttal on Remand No. 3, p. 2.

B. The Commission Should Reject the Protestants' Proposal to Underground the Woodbourne-Heaton Line

In their May 14 position statement, the Protestants also propose that the existing overhead Woodbourne-Heaton line should

² During cross-examination, questions were posed that appeared to be predicated on the assumption that PECO could purchase the noted properties and then resell those properties to other individuals. PECO would simply note that, since the Protestants' stated justification for this proposal is their view that EMF has been demonstrated to cause adverse human health effects, it is inappropriate to assume that properties, once purchased under that view, could or should be sold to others.

be replaced with an underground line. Again, the Commission should reject this proposal.

First, just as with Protestants' proposal to purchase properties, the proposal to bury the line is based on the invalid assumption that adverse health effects of EMF have been demonstrated.

Second, the proposal would cost \$38.5 million at a minimum. PECO Rebuttal on Remand No. 1, p. 1. Moreover, it would take at least 2 years to construct an underground line. Id.

Third, there was unrebutted testimony that this proposal is not consistent with the concept of prudent avoidance because its cost is not "small or modest." PECO Rebuttal on Remand No. 2, p. 4.

PECO submits that Protestants' proposals should be rejected as having no justification, being too costly, and being inconsistent with the concept of prudent avoidance.

PROPOSED FINDINGS OF FACT

1. The right-of-way for the Woodbourne-Heaton line is contained within a wider, existing utility corridor. (PECO Direct on Remand No. 1 [Oedemann], p. 2.)

2. The utility corridor in which the Woodbourne-Heaton line was constructed has several existing or recent public utility uses, including: (1) an active Conrail rail freight system, (2) until 1986, an electric 132 kV transmission line operated by Amtrak as part of its bulk power system, (3) a Conrail power feed and signal communication system, and (4) the Woodbourne-Heaton 230 kV transmission line. (PECO Direct on Remand No. 1 [Oedemann], p. 2.)

3. The existing utility corridor in which the Woodbourne-Heaton line was constructed, as measured at the transmission structures, is approximately 100 feet wide at its narrowest points and approximately 995 feet wide at its widest points. (PECO Direct on Remand No. 1 [Oedemann], p. 2.)

4. The magnetic fields at the edge of this wider utility corridor, under normal operating conditions, will be in the range of approximately 19 mG to well under 0.5 mG. (PECO Direct on Remand No. 2 [Boeggeman], p. 3.)

5. The Swedish residential study by Feychting and Ahlbom negative or null for childhood brain cancer, "all childhood cancers," and for adult cancers. (PECO Direct on Remand No. 4 [Cole], pp. 4, 8.)

6. The Swedish residential study is very small for childhood leukemia. Only 38 cases of childhood leukemia were included in the study. (PECO Direct on Remand No. 4 [Cole], p. 4.)

7. In the Swedish residential study, children who had lived near transmission lines had cancer at the same rate as children who had not lived near transmission lines. (N.T. 1684 [Cole].)

8. In the Swedish residential study, children who had lived in the transmission corridor for the largest percentage of their lives had the smallest risk of leukemia. (PECO Direct on Remand No. 4 [Cole], p. 4.)

9. The National Radiological Protection Board of the United Kingdom and the Oak Ridge Associated Universities reviewed the Swedish residential study and concluded that it does not prove that exposure to EMF causes childhood cancer. (PECO Direct on Remand No. 4 [Cole], pp. 5-6.)

10. The Swedish residential study does not support a conclusion that EMF is a cause of childhood cancer. (PECO Direct on Remand No. 4 [Cole], p. 7.)

11. After extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects. (PECO Direct on Remand No. 3 [Bockman], p. 5; PECO Direct on Remand No. 4 [Cole], pp. 11-12; PECO Direct on Remand No. 5 [Gelmann], p. 5; N.T. 1626 [Janes]; N.T. 1710-15 [Gelmann]; N.T. 1656, 1667, 1670 [Cole].)

12. There is no health basis for setting magnetic field standards for the Woodbourne-Heaton line. (PECO Direct on Remand No. 3 [Bockman], p. 5; PECO Direct on Remand No. 4 [Cole], p. 11; PECO Direct on Remand No. 5 [Gelmann], p. 5; OCA Statement No. 1B, [Janes], p. 11.)

13. Mr. Janes did not recommend that the Commission adopt a similarity-based magnetic field standard for the Woodbourne-Heaton line. (N.T. 1626-27 [Janes].)

14. The right-of-way for the Woodbourne-Heaton line is consistent with the concept of prudent avoidance because it has low magnetic field levels at the edge of the right-of-way and because it is contained within a wider, existing utility corridor. (PECO Direct on Remand No. 2 [Boeggeman], pp. 3-4.)

15. Development of similarity-based magnetic field standards is a complex undertaking fraught with unresolved problems. (PECO Rebuttal on Remand No. 2 [Boeggeman], p. 2-3.)

16. The cost of Protestants' proposal to have PECO purchase properties near the line would be a minimum of \$160 million. (PECO Rebuttal on Remand No. 3 [Frieman], p. 2.)

17. Protestants' proposal to have PECO purchase properties is not consistent with the concept of prudent avoidance. (PECO Rebuttal on Remand No. 2 [Boeggeman], pp. 3-4.)

18. Protestants' proposal to replace the existing overhead Woodbourne-Heaton transmission line with an underground line would cost a minimum of \$38.5 million. (PECO Rebuttal on Remand No. 1 [Oedemann], p. 1.)

19. Protestants' proposal to replace the existing overhead Woodbourne-Heaton transmission line with an underground line is not consistent with the concept of prudent avoidance. (PECO Rebuttal on Remand No. 2 [Boeggeman], pp. 3-4.)

PROPOSED CONCLUSIONS OF LAW

1. The Woodbourne-Heaton 230 kV transmission line does not pose an unreasonable risk of danger to safety or health. 52 Pa. Code § 52.76.

2. The design, route, and right-of-way width of the Woodbourne-Heaton 230 kV transmission line are consistent with the concept of prudent avoidance.

3. No right-of-way width standards shall be developed or adopted for the Woodbourne-Heaton 230 kV transmission line.

PROPOSED ORDER

In consideration of the foregoing, it is ORDERED:

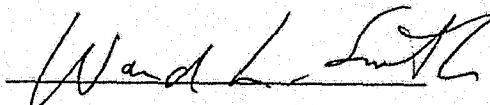
1. The February 9, 1990 Order approving Philadelphia Electric Company's Woodbourne-Heaton 230 kV transmission line is hereby reaffirmed.

2. Philadelphia Electric Company is authorized to energize the Woodbourne-Heaton line and thereafter operate and maintain it in accordance with the National Electrical Safety Code.

CONCLUSION

For the reasons stated above, the Commission should adopt PECO's Proposed Findings of Fact and Conclusions of Law and issue an Order reaffirming its February 9, 1990 approval to reconstruct and energize the Woodbourne-Heaton 230 kV transmission line.

Respectfully submitted,



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June 16, 1993

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of Philadelphia Electric Company's Initial Brief on Remand upon the following parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54:

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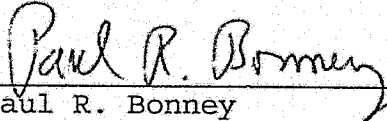
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ORIGINAL



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June 16, 1993

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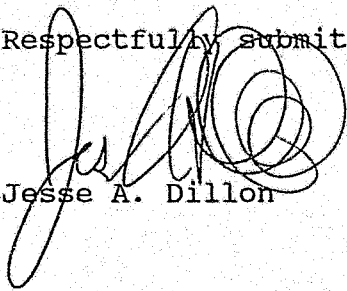
HAND DELIVERED

Mr. John G. Alford, Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
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Re: Letter of Notification of Philadelphia
Electric Company Relative to Reconstructing
and Rebuilding of the Existing 138 kV Line
to Operate as a Woodbourne-Heaton 230 kV
Line in Montgomery and Bucks Counties;
Docket No. A-110550F055

Dear Secretary Alford:

Enclosed for filing is an original and nine (9)
copies of Pennsylvania Power & Light Company's Main Brief on
Remand in the above-referenced proceeding. Pursuant to the
Administrative Law Judge's letter dated June 4, 1993, two (2)
copies of this brief are being served on the ALJ, and three
(3) copies of this brief are being served on all parties of
record.

Respectfully submitted,

Jesse A. Dillon

Enclosure

cc: Certificate of Service

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NVL

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF
PHILADELPHIA ELECTRIC COMPANY RELATIVE
TO RECONDUCTORING AND REBUILDING THE
EXISTING LINE TO OPERATE AS A WOODBOURNE-HEATON
230. KV LINE IN BUCKS AND MONTGOMERY COUNTIES

Docket No. A-110500F055

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TO ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

MAIN BRIEF ON REMAND
ON BEHALF OF
PENNSYLVANIA POWER & LIGHT COMPANY

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Attorney for Pennsylvania
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Dated: June 16, 1993

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JUL 01 1993

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I. HISTORY OF THE PROCEEDING

This proceeding has a lengthy history prior to this remand, which was summarized in Pennsylvania Power & Light Company's ("PP&L") original Main Brief, PP&L's Exceptions to Administrative Law Judge Herbert Smolen's (the "ALJ") first Initial Decision, and the Pennsylvania Public Utility Commission's ("Commission") previous orders in this case. PP&L will not herein repeat this prior history.

However, on March 26, 1993, the Commission entered an order remanding this proceeding to the ALJ for two limited purposes, namely:

- a) receiving evidence and comment regarding all studies of the health effects of magnetic fields, which are available on or before the hearings on that evidence commence; and
- b) determining, in light of findings regarding health effects, what, if any, standards should exist for right-of-way width for the Woodbourne-Heaton 230 kV line. Order entered March 26, 1993, pp. 22-23.

As a result of this order, on April 9, 1993, the ALJ entered a prehearing conference order establishing a procedural schedule for conducting the remand hearings. Written Direct Testimony on Remand was submitted by Philadelphia Electric Company ("PECO") and the Office of Consumer Advocate ("OCA"). Written Rebuttal Testimony on Remand was submitted by PECO. In addition, PP&L, the Commission's Law Bureau Prosecutory Staff ("Law Bureau") and the Protestants all filed statements of their position in the proceeding pursuant to the ALJ's order dated May 6, 1993,

requiring such statements.^{1/} Hearings on Remand were held on May 27, 28, and June 1, 1993 in Philadelphia.

^{1/} In lieu of participating in the evidentiary phase of this proceeding, the Office of Trial Staff ("OTS") filed a Petition For Reconsideration of the Commission's Order entered March 26, 1993, requesting that the Commission "expand indefinitely the time limit on the proceeding" and expand markedly the scope of the remand proceeding. The Commission denied OTS' Petition. PP&L disagrees with OTS, and continues to urge OTS to thoroughly and carefully review all of the extensive EMF evidence and briefs in this proceeding and whatever "evidence" OTS allegedly has to present in the GPU/DQE proceeding to see if there is any valid scientific reasoning or any acceptance within the scientific community behind its apparent position on adverse health effects of EMF.

II. STATEMENT OF THE QUESTIONS INVOLVED

- (1) Do the additional studies relating to possible health hazards from magnetic fields available as of the commencement of hearings in this case form a basis for concluding that magnetic fields cause adverse health effects in humans?
- (2) In light of the answer to the first question, what, if any, right-of-way width or edge of right-of-way magnetic field standards should be established for the Woodbourne-Heaton 230 kV Transmission Line.

III. INTRODUCTION

PP&L, as an intervenor in this proceeding, does not intend to submit an extensive brief on remand duplicating the efforts of other parties to this proceeding. Instead, PP&L is filing a short main brief on remand which addresses the two questions presented and reiterates PP&L's proposed alternative to any recommendation that the Commission establish standards for magnetic fields at the edge of right-of-way or right-of-way width standards.

PP&L follows the issue of Electric and Magnetic Fields ("EMF") closely and has led the way in establishing a comprehensive EMF policy which includes support for EMF research, EMF public communications materials, a Magnetic Field Management Program, EMF measurements, and extensive, early public involvement in the transmission line siting process. For these reasons, PP&L believes that it may be able to provide useful input on this extremely complex issue.

IV. SUMMARY OF ARGUMENT

The recent studies of possible adverse health effects of magnetic fields do not form a basis for concluding that magnetic fields or EMFs cause or contribute to adverse health effects in humans. Accordingly, the Commission should not establish right-of-way width or edge of right-of-way magnetic field standards for this transmission line. The ALJ and the Commission should permit this line to be energized and simultaneously begin to address public concern about EMF by mandating that all utilities in the Commonwealth undertake a comprehensive EMF policy consistent with principles of prudent avoidance.

V. ARGUMENT

A. The Recent Studies Of Possible Adverse Health Effects Of Magnetic Fields Do Not Form A Basis For Concluding That Magnetic Fields Cause Or Contribute To Adverse Health Effects In Humans

As demonstrated by the record in this remand proceeding, and as confirmed by the reviews of groups of independent scientists who have reviewed the recent research in this area, the recent studies of possible adverse health effects from magnetic fields do not form a basis for concluding that magnetic fields (or EMFs) cause or contribute to adverse health effects in humans.

1. The Record In This Remand Proceeding

(a). Testimony Of PECO

In the remand proceeding, PECO submitted the direct testimony of Drs. Richard S. Bockman, Philip Cole and Edward P. Gelmann. Drs. Bockman, Cole and Gelmann reviewed the research related to EMF in the areas of Endocrinology and Immunology (Dr. Bockman), Epidemiology (Dr. Cole) and Molecular Genetics, Cellular Biology and Cancer (Dr. Gelmann) that had become available since the time of their previous testimony in this proceeding. The reputations and experience of these individuals, who are both medical doctors and distinguished scientists, are described in PP&L's Initial Main Brief and will not be repeated herein. They concluded as follows:

Endocrinology and Immunology

"...it is my opinion that power frequency electric and/or magnetic fields several times stronger than those experienced under transmission lines do not disrupt the Endocrine or Immune Systems..." PECO Direct on Remand St. No. 3, p. 5 (Dr. Bockman).

Epidemiology

"Taken together, the epidemiologic reports fail to demonstrate any strong or consistent pattern of association between EMF and cancer in human beings. The summation can only be that, to date, there is no demonstrated relationship between EMF and cancer in human beings." PECO Direct on Remand St. No. 4, p. 11 (Dr. Cole).

Molecular Genetics, Cellular Biology and Cancer

"...it is still my opinion that the scientific research provides no basis to conclude that power frequency fields cause, promote, or otherwise contribute to the development of cancer or other adverse health effects." PECO Direct on Remand St. No. 5, p. 5 (Dr. Gelmann).

(b). Testimony Of OCA

In the remand proceeding, the OCA presented the direct testimony of Mr. David E. Janes, who has "over thirty years of experience in analyzing the effects and risks of exposure to ionizing radiation and electromagnetic fields."

OCA St. No. 1B, p. 1. Mr. Janes concluded as follows:

"At this time, biophysical mechanisms for how weak fields might interact with biological systems to produce harm have not been demonstrated experimentally. Without a viable biophysical mechanism to connect them, the results of the epidemiological, animal, and cellular level studies alone are not strong enough to establish a causal link between exposure to power frequency fields and harmful effects. On the other hand, the experimental evidence makes the hypothesis of harmful effects plausible, and the possibility of harm cannot be

summarily dismissed. This results in the unfortunate situation that even after considerable investigation and research, we are uncertain about whether or not exposure to weak power frequency electric and magnetic fields can cause harm." OCA St. No. 1B, p. 5.

(c). Other Testimony

No other witnesses submitted remand testimony on this issue other than the witnesses whose testimony is summarized above.

2. The Recent Independent Scientific Panels That Have Reviewed The Scientific Literature On EMFs And Possible Health Effects

Scattered throughout the testimony in this remand proceeding are references to the recent reports of independent panels of scientists that have reviewed the research on EMFs and possible adverse health effects. As PP&L explained in its Initial Main Brief in this proceeding, in addition to reviewing primary scientific literature, such as reports of published experiments and studies found in peer-reviewed journals, one other way of determining whether there is general scientific acceptance of a position is to examine the publicly available reports of panels of scientific experts, independent of the utility industry, which have reviewed the scientific literature. When such recent reports are reviewed, it is clear that the independent scientific and governmental panels which have recently reviewed the scientific literature on EMF and possible health

effects have concluded that there is no present scientific basis upon which to conclude that EMFs pose a human health hazard.

Some of the recent reports cited in the testimony of the witnesses in this remand proceeding, including some reports which have considered the new Swedish epidemiologic studies, have concluded as follows:

<p>"The question whether ELF-EMF has a carcinogenic effect represents an intriguing scientific problem. ELF-EMF clearly cannot be exonerated, since very large and valid studies showing no association with cancer occurrence do not currently exist, but it is also clear that the available base of observation and theory does not satisfy major criteria for causal inference."</p>	<p>Oak Ridge Associated Universities Panel on Health Effects of Low Frequency Electric and Magnetic Fields, "Health Effects of low frequency electric and magnetic fields." Report prepared by an Oak Ridge Associated Universities Panel for the Committee on Interagency Radiation Research and Policy Protection (June, 1992). Cited in PECO Direct on Remand St. No. 4, p. 6, and in OCA St. No. 1B, p. 2.</p>
<p>"Because the two Swedish studies were made public when the ORAU report was already in the printing process, we consider it necessary to indicate that, in our opinion, the evidence presented in these studies is not sufficiently compelling to alter the conclusions of the ORAU report."</p>	<p>Oak Ridge Associated Universities Panel on Health Effects of Low-Frequency Electric and Magnetic Fields, "EMF and Cancer," 260 Science 13-14 (April 2, 1993). Cited in PECO Direct on Remand St. No. 4, p. 6.</p>

<p>"In summary, the epidemiological findings that have been reviewed provide no firm evidence of the existence of a carcinogenic hazard from exposure of paternal gonads, the fetus, children, or adults to extremely low frequency electromagnetic fields that might be associated with residence near major sources of electricity supply, the use of electrical appliances, or working in the electrical, electronics, and telecommunications industry."</p>	<p>Advisory Group on Non-Ionising Radiation (Sir Richard Doll, Chairman) "Electromagnetic fields and the risk of cancer," National Radiological Protection Board (U.K.), 3 Documents of the NRPB (1992). Cited in PECO Direct on Remand St. No. 4, p. 5, and in OCA St. No. 1B, p. 2.</p>
<p>Recent studies, including the Swedish Residential study, "...do not establish that exposure to EMF is a cause of cancer, although they provide weak evidence to suggest the possibility exists."</p>	<p>Advisory Group on Non-Ionising Radiation (Sir Richard Doll, Chairman) "Electromagnetic Fields and the risk of cancer," National Radiological Protection Board (U.K.), (March 23, 1993). Cited in PECO Direct on Remand St. No. 4, p. 5</p>

These independent reports reinforce the conclusion that the recent studies do not form a scientific basis for concluding that EMFs (or magnetic fields alone) cause adverse health effects in humans. In fact, no witness in this remand proceeding has even alleged that the recent studies form a basis for concluding that EMFs cause adverse health effects in humans.

B. The Commission Should Not Establish
Right-of-Way Width Or Edge Of Right-of-
Way Magnetic Field Standards For This
Transmission Line

No witness to this remand proceeding advocated establishing any right-of-way width or edge of right-of-way magnetic field standards of any type for the Woodbourne-Heaton 230 kV Transmission Line. As explained previously by PP&L in this proceeding (Exceptions of PP&L at pp. 6-12), there are essentially two types of magnetic field or right-of-way standards which could be employed -- health based standards and similarity based standards.

1. Health Based Standards

Regarding the possibility of establishing a so-called "health based" standard, the witnesses to this proceeding stated that such a standard could not possibly be established at this time. Specifically, they stated as follows:

Mr. David E. Janes

- Q. In your opinion, can a health-based standard for power frequency electric and magnetic fields be established at this time?
- A. No. The uncertainties are just too great. In my opinion the uncertainties preclude the possibility of setting a credible health based standard at this time. OCA St. No. 1B, pp. 11-12.

Dr. Richard S. Bockman

- Q. Dr. Bockman, based on your review of the research in your area of expertise, do you have any opinion as to whether magnetic field right-of-way width standards can be scientifically justified?
- A. Since it is my opinion that power frequency electric and/or magnetic fields several times stronger than those experienced under transmission lines do not disrupt the Endocrine or Immune Systems, I see no reason from the Endocrine or Immune science for setting such standards. PECO Direct on Remand St. No. 3, p. 5.

Dr. Philip Cole

- Q. Dr. Cole in your opinion, does the epidemiologic research, taken as a whole, provide a basis for setting a standard for right-of-way width or for a specific milligauss level at the edge of the right-of-way for the Woodbourne-Heaton 230 kV line?
- A. No. Since I am of the opinion that EMFs have not been demonstrated to be carcinogenic, I believe that the Woodbourne-Heaton 230 kV transmission line poses no threat of cancer to persons in its vicinity. The epidemiologic research thus provides no reason to set any standards related to this line. Moreover, it does not provide any effective basis for setting such a standard. PECO Direct on Remand St. No. 4, p. 12.

Dr. Edward P. Gelmann

- Q. Dr. Gelmann, does the EMF research in your area of expertise support a limitation on right-of-way width for transmission lines?
- A. No. I see no scientific or medical basis to develop a right-of-way width standard. PECO Direct on Remand St. No. 5, p. 5.

In stark contrast to the above-quoted testimony, one party to this proceeding, namely the Protestants, did propose a health based standard, but submitted no testimony

supporting its proposal. Specifically, the counsel for Protestants alleges, in Protestants' Statement of Position, that "[t]he impact of electromagnetic fields on children has been demonstrated through the Swedish study and through general consensus at this time" and therefore "the specific milligauss which should be allowed is no discernable milligauss (non detect) from the power line at maximum loading." Letter dated May 14, 1993 from Robert J. Sugarman, Esquire. Protestants then propose various means to achieve this health-based edge of right-of-way standard through location of the line, purchasing properties, undergrounding and so on. Id. However, Protestants submitted no testimony in this remand proceeding supporting their position, and are simply incorrect in their underlying assumption that the impact "has been demonstrated."

As shown by the record testimony in these remand hearings, the record testimony in the previous round of hearings and the numerous reports of independent scientific panels that have reviewed the literature on EMFs and possible health effects, as opposed to the non-testimonial statements of the lawyer for the Protestants, the alleged "impact of electromagnetic fields on children" has not been demonstrated through either the Swedish study or general scientific consensus. If anything, the general scientific consensus on this issue, based on the recent independent scientific panel reports, is that the "impact" alleged by the Protestants'

attorney has not been demonstrated, even after the Swedish study. Therefore, Protestants' basis for their position is simply and blatantly wrong, and their position advocating health-based standards must be rejected.

2. Similarity Based Standards

No witness or party to the proceeding advocated establishing similarity based right-of-way width or edge of right-of-way magnetic field standards, although OCA's witness, Mr. David E. Janes, explained at some length how such standards had been developed in Florida and New York and how such standards could be established. OCA St. No. 1B, pp. 12-14 and 16-17. Mr. Janes did make it clear, however, that he was not proposing that the Commission set any standard for magnetic fields at the edge of the Woodbourne-Heaton right-of-way. Tr. 1626-27.

At pages 6 through 12 of its previously-filed Exceptions this proceeding, PP&L identified a number of concerns with establishing similarity based standards that it will not repeat herein, given that no party proposes the Commission adopt any such standards. PP&L's prior criticisms of adopting similarity based standards still hold true today.

C. While PECO Should Be Permitted To Energize This Line Immediately, The ALJ And The Commission Should Also Take Concrete Steps To Begin To Address Public Concern About Possible Adverse Health Effects
From EMF

The upshot of all of the testimony on the two remanded issues, when combined with the ALJ's previous findings that PECO's Woodbourne-Heaton 230 kV Line comport a with a policy of "prudent avoidance" based on an after-the-fact review (See PP&L's Exceptions at pp. 12-14; I.D. issued August 19, 1992 at pp. 134, 205-207), is that no purpose is served by further delay in energization of this line, and that the Commission should permit the line to be energized.

However, PP&L believes that the Commission should go further. Based on the record in this case, PP&L strongly urges the ALJ and the Commission to take immediate, concrete steps to begin to address the concern that some members of the public have expressed over the EMF issue in this case, even though EMFs have not been proven to cause adverse health effects in humans. Further, both the ALJ and the Commission are aware that the EMF issue concerns many more citizens of this Commonwealth than just those who protested and testified in this case.

The total record of this proceeding and how it arose and developed, taken as a whole, shows that electric utilities in this Commonwealth should be actively engaged in a proactive, aggressive and comprehensive EMF policy designed to address up front, in advance, and to the extent reasonably

possible, the concerns about the EMF issue currently expressed by some members of the public. At the same time, the total record in this proceeding shows that PECO should be permitted to energize the Woodbourne-Heaton 230 kV Line immediately, without further delay.

- D. Therefore, The ALJ And The Commission Should Permit This Line To Be Energized And Simultaneously Begin To Address Public Concern About EMF By Mandating That All Utilities In This Commonwealth Undertake A Comprehensive EMF Policy Consistent With Principles Of Prudent Avoidance

Specifically, PP&L proposes that the ALJ and the Commission take the following actions based on the record in this case:

- Permit PECO to energize the Woodbourne-Heaton Line without further delay based on, among other things, the ALJ's extensive previous findings that the line meets standards of "prudent avoidance."
- Institute either a policy statement proceeding or a rulemaking proceeding to mandate that all electric utilities in the Commonwealth adopt a comprehensive EMF policy as explained below.
- Expressly state that any transmission line siting proceeding either currently pending or filed before the final promulgation of the policy statement or regulations, will not be delayed but will be decided on its individual merits as is current Commission practice.

1. Elements Of The Mandated Comprehensive EMF Policy Proposed By PP&L

Specifically, as part of its final order in this case, the Commission should open either a rulemaking proceed-

ing or a policy statement proceeding in which the Commission would mandate that all utilities institute a comprehensive EMF policy. This mandated comprehensive EMF policy would be directly aimed at addressing the concerns of the public over EMF instead of attempting to set either similarity-based or arbitrary EMF standards. The comprehensive EMF policy mandated by the Commission should consist of the following elements:

Support for EMF Research

- Electric utilities, through support of the Electric Power Research Institute (EPRI) and other means, shall support research into EMFs, EMF management and reduction technologies and possible health effects of EMFs.

Dissemination of EMF Information

- Electric utilities shall prepare and make available to the public easily understandable information about EMFs and the results of research into possible human health effects of EMF. Electric utilities shall regularly update these materials as new scientific evidence becomes available.

Provision of EMF Measurements

- Electric utilities shall provide or arrange for EMF measurements for any customers or affected property owners who request such measurements.

Establishment of Magnetic Field Management Plan

- Electric utilities shall establish flexible plans for reducing Magnetic Fields and exposure to Magnetic Fields at low cost or no cost, where practicable, in new or reconstructed transmission lines. An electric utility's Magnetic Field Management Plans shall include, at a minimum, the following elements: consideration of transmission

line design and construction techniques which could reduce Magnetic Fields at low or no cost, such as alternative line configurations and higher ground clearances, and consideration of population density and location of public facilities in the route selection and evaluation process. Electric utilities shall include in all siting applications and letters of notification information explaining application of their Magnetic Field Management Plans.

Involvement of the Public in the Transmission Line Siting Process

- Electric utilities shall involve the public directly at each stage of the transmission line siting process, namely the gathering of data, the selection of alternative routes and the selection of preferred routes. EMFs and EMF Management Plans and techniques shall be considered and discussed with the public at all stages of the siting process.

2. The Mandated EMF Policy Proposed By PP&L Addresses Public Concerns Over EMFs

The mandated EMF Policy proposed by PP&L would be a concrete step toward addressing the public's concerns over EMFs. PP&L's proposal would ensure that utilities are taking steps designed to address the public's concerns in a positive way through research, communications, measurements and field management and to involve the public in the decision-making process through mandated, early involvement in the siting process. Other actions, such as similarity based EMF edge of right-of-way standards, simply would not address the public's concerns about EMF, as does PP&L's proposal.

This approach of mandating prudent EMF policies to be pursued by electric utilities has been employed by other

states in an attempt to address EMF concerns. For instance, the Wisconsin Public Service Commission rejected calls for a moratorium in favor of expansion of its previously mandated prudent EMF measures. See, e.g., Re Advance Plans for Construction of Facilities, 138 P.U.R. 4th 193 (Wisconsin P.S.C. 1992).

Further, adoption by the Commission of a mandated EMF policy for electric utilities would establish some level of uniformity among utilities in the Commonwealth. While some electric utilities are already undertaking all of the suggested elements of the mandated EMF Policy, other electric utilities may be undertaking only some of these steps. A mandated statewide policy would provide uniformity and guidance as to which EMF-related actions electric utilities in the Commonwealth should pursue. Such a mandated statewide policy would also ensure that these actions were taking place in advance of transmission line filings such as this one.

3. The Mandated EMF Policy Proposed By PP&L Is Consistent With The Principle Of "Prudent Avoidance" And The Prudence Measures Suggested By The OCA

PP&L intentionally has avoided the term "prudent avoidance" both in its internal policies on EMF and in its proposed statewide EMF policy, even though both its internal policies and the proposed statewide EMF policy follow the principles of "prudent avoidance." As correctly noted by the ALJ previously, the term "prudent avoidance" is merely a

framework for analyzing actions relating to EMFs in light of the scientific uncertainty and not a definable term. I.D. issued August 19, 1992, at 198-99.

Further, as shown by the evidence in this case, the term "prudent avoidance" itself is capable of different interpretations, especially by lay persons who tend to interpret the term as meaning "it is prudent to avoid any exposures to EMFs." See, e.g., I.D. issued August 19, 1992 at 131. At least one utility commissioner has written that the term "prudent avoidance" itself "borders on being merely clever verbiage which means different things to different people." Supra, 138 P.U.R. 4th at 204. OCA apparently prefers the terminology "prudent policy in the face of uncertainty." OCA St. No. 2, pp. 7-8. OCA St. No. 1B, pp. 15-16.

In any event, notwithstanding concerns about the term "prudent avoidance," PP&L's proposed statewide EMF policy is consistent with principles of "prudent avoidance," as articulated in this proceeding. PECO Reb. St. No. 6, pp. 15-19; I.D. issued August 19, 1992 at 198-99. Further, the mandated EMF policy proposed by PP&L is consistent with the recommended prudent policy in the face of uncertainty that is espoused by OCA. OCA St. No. 2, p. 8. OCA St. No. 1B, pp. 15-16.

In fact, OCA's suggested prudence measures are very similar to those suggested by PP&L and include the following:

- Research into the effects of electric and magnetic fields should be continued.

- The government and the industry should be aggressive in periodically informing the public about the latest information, stressing its uncertainty and changeability. This needs to be done in an absolutely impartial manner and before it is required.
- The public should be involved in the decision making process before critical decisions are made. This is not at all the same thing as having public meetings or private sessions with concerned individuals to convince them after the decision is made.
- At the very least, companies considering power line projects should consider the cost and effects of possible mitigative measures before any construction is decided on.

Mitigative measures that should be considered before construction begins may include, but are not limited to:

- avoiding heavily populated areas
 - avoiding parks, schools, and other public facilities
 - widening rights-of-way
 - limiting public uses of rights-of-way
 - using higher ground clearances
 - designing the power lines to reduce the fields
- In planning one should err on the side of safety, but not without considering the cost. OCA St. No. 1B, pp. 15-16.

4. Nothing Would Be Served By Further Delaying Energization Of The Woodbourne-Heaton Line

Further, given the ALJ's extensive findings regarding the Woodbourne-Heaton Line's compliance with principles of prudent avoidance (See I.D. issued August 19, 1992, at pp. 134, 205-207) and the Commission's previous determinations about compliance with the Commission's regulations, no purpose would be served by further delaying energization of this line. There is simply nothing else left for the ALJ or the Commission to do with regard to this line but to permit

its energization, to move forward and to mandate policies which address public concern and which might minimize or prevent similar litigation in the future.

PP&L's proposed solution provides a better means of moving forward constructively than would any proposal to further delay energization and adopt extremely questionable standards, such as those proposed by Protestants.

5. PP&L's Proposed Solution Attempts To Eliminate Any Concerns About A De Facto Moratorium

Finally, PP&L's proposed solution should eliminate any concerns about a de facto moratorium over new transmission line siting and construction. If the Commission clearly states that new siting and construction is to continue during any delay in promulgation of a policy statement or regulation, the Commission can prevent increases of magnetic field levels on existing facilities and permit electric utilities to continue to meet their statutory obligations to provide reasonably adequate and economic service during the pendency of the EMF policy statement or regulation proceeding.

VI. PROPOSED FINDINGS OF FACT
AND CONCLUSIONS OF LAW

A. Additional Proposed Findings Of Fact On Remand

1. The recent studies of possible adverse health effects from magnetic fields (or EMFs) do not form a basis for concluding that magnetic fields (or EMFs) cause or contribute to adverse health effects in humans. PECO Direct on Remand St. No. 3, p. 5; PECO Direct on Remand St. No. 4, p. 11; PECO Direct on Remand St. No. 5, p. 5; OCA St. No. 1B, p. 5.

2. Recent reports of independent scientific and governmental panels which have reviewed the scientific literature on EMF and possible health effects have concluded that there is no present scientific basis on which to conclude that EMFs pose a health hazard. PECO Direct on Remand St. No. 4, pp. 5 and 6; OCA St. No. 1B, p. 2.

3. No health based right-of-way width or edge of right-of-way magnetic field standard can be established or justified at this time. OCA St. No. 1B, pp. 11-12; PECO Direct on Remand St. No. 3, p. 5; PECO Direct on Remand St. No. 4, p. 12; PECO Direct on Remand St. No. 5, p. 5.

4. No party to this proceeding proposed establishing a similarity based right-of-way width or edge of right-of-way magnetic field standard. PECO Direct on Remand St. Nos. 1, 2, 3, 4 and 5; OCA St. No. 1B; Tr. 1626-27.

5. PECO's Woodbourne-Heaton 230 kV Transmission Line comports with a policy of "prudent avoidance" based on an after-the-fact review. PECO Direct on Remand St. No. 2, pp. 3-4; See Also I.D. issued August 19, 1992 at pp. 134, 205-07.

B. Additional Proposed Conclusions Of Law On Remand

1. The preponderance of evidence in this case does not demonstrate that EMFs cause or contribute to adverse health effects in humans.

2. There should be no health based or similarity based right-of-way width or edge of right-of-way magnetic field standards for the Woodbourne-Heaton 230 kV Transmission Line.

3. The Woodbourne-Heaton 230 kV Transmission Line complies with all applicable safety regulations and principles of "prudent avoidance," and PECO should be permitted to energize the Woodbourne-Heaton 230 kV Transmission Line.

4. The Commission should institute either a policy statement proceeding or a rulemaking proceeding to mandate that all electric utilities in the Commonwealth undertake a Comprehensive EMF Policy as explained in this order.

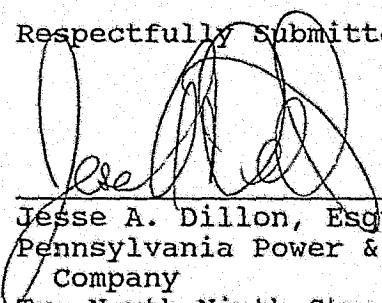
5. All line siting applications currently pending and received during the pendency of the regulation or policy statement proceeding on a Comprehensive EMF Policy will not be delayed pending the outcome of the EMF proceeding, but

will be decided on their individual merits in accordance with present procedures.

VII. CONCLUSION

WHEREFORE, for all of the foregoing reasons, the Administrative Law Judge and the Pennsylvania Public Utility Commission should: 1) permit the Woodbourne-Heaton Line to be energized; 2) institute a proceeding which would mandate that all electric utilities in the Commonwealth adopt a comprehensive EMF Policy as explained above; and 3) state expressly that line siting applications currently pending and received during the pendency of the regulation or policy statement proceeding on a comprehensive EMF Policy will not be delayed pending the outcome of the EMF proceeding, but will be decided on their individual merits in accordance with present procedures.

Respectfully Submitted,



Jesse A. Dillon, Esquire
Pennsylvania Power & Light
Company
Two North Ninth Street
Allentown, Pennsylvania 18101
(215) 774-5013

Dated: June 16, 1993
at Allentown, Pennsylvania

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

In re: Letter of :
Notification of Philadelphia :
Electric Company Relative to :
Reconstructing and Rebuilding : Docket No.
of the Existing 138 kV Line to : A-110550.F055
Operate as a Woodbourne-Heaton :
230 kV Line in Montgomery and :
Bucks Counties :

CERTIFICATE OF SERVICE

I hereby certify that I have this date served a true copy of the foregoing document upon the participants, listed below, in accordance with the requirements of § 1.54 (relating to service by a participant):

VIA HAND DELIVERY

The Honorable Herbert S. Smolen
Administrative Law Judge
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Dianne E. Dusman, Esquire
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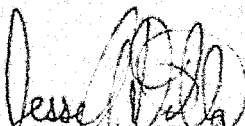
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Jesse A. Dillon

Dated: June 16, 1993
at Allentown, Pennsylvania

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LEGAL ASSISTANTS

*NOT ADMITTED IN PENNSYLVANIA

June 16, 1993

RECEIVED

JUN 13 1993

SECRETARY'S OFFICE
Public Utility Commission
Public Utility Commission

Mr. John G. Alford, Secretary
Pennsylvania Public Utility
Commission
Room G-18, North Office Building
Harrisburg, PA 17120

Re: Letter of Notification of Philadelphia Electric
Company at Docket No. A-110550F055

Dear Mr. Alford:

Enclosed please find for filing Protestants' Proposed Finding
of Fact and Conclusions of Law in the above-referenced matter.

Sincerely,


Robert J. Sugarman

RJS:er
Enclosure

cc: Service List

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FOLDER

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ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

IN RE: LETTER OF NOTIFICATION :
OF PHILADELPHIA ELECTRIC COMPANY :
UNDER 52 PA CODE §57.72(d) : DOCKET NO. A-110550F055
RE: PROPOSED 230 KV WOODBOURNE :
TO HEATON TRANSMISSION LINE :

RECEIVED

DOCKETED

JUL 07 1993

PROTESTANTS' PROPOSED FINDING OF
FACT AND CONCLUSIONS OF LAW

JUN 18 1993

SECRETARY'S OFFICE
Public Utility Commission

I. HISTORY

1. The need and necessity for the line has never been determined on a record, since no hearings were held prior to the initial approval granted in March 1990.

2. The protestants were denied opportunity to contest the need for the line, since they were not notified of the Application: they learned of the new line only when they observed trees being cut after the Commission approved the Application by letter. (Petition, Sept. 6, 1990).

3. The Commonwealth Court, per Judge Palladino, held that the Commission had denied notice and thus an opportunity for a hearing, and required that the Commission reopen the case. (No. 761 C.D. 1991, May 24, 1991).

4. Despite the finding that the order was invalid, the Commission did not appeal (nor did applicant) but the Commission limited its reopening, initially, to the issue of effect on the protestants. (June 14, 1991).

5. Accordingly, the ALJ limited the initial proceedings to the issue of effect, and excluded any questions relating to the

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need for the line, as well as alternative locations, from the proceedings. (July 18, 1991).

6. The protestants amply demonstrated a severe adverse affect on them as a result of their reasonable concerns about potential health impacts, as determined by the ALJ, and affirmed by the Commission.

7. Nevertheless, the Commission continued to decline to allow hearings on the need for the line, and alternatives to it; directing the ALJ to hold further hearings limited to the potential mitigation measures.

II. Findings of Fact

1. The protestants lacked resources to provide additional expertise to evaluate and comment on the present state of research into electromagnetic fields impacts. (Counsel Tr. 1704).

2. The applicant failed to present any evidence as to appropriate mitigation measures, continuing to contend, contrary to the Commission's initial decision, that no mitigation is required.

3. The OCA produced witnesses who refused to opine as to appropriate mitigation measures. (Tr. ____ 1616 - 1618.)

4. Through cross examination, the protestants elicited from the applicants' witnesses that undergrounding the line would merely double the overhead line cost; (Tr. 1569 - 1572) that acquisition of additional rights of way by purchasing residential properties voluntarily at fair market value has not been priced, but could be accomplished, and the properties resold; according to the

applicants' witnesses, a good market exists for such properties to be voluntarily sold. (Tr. 1594 - 1595, 1599, 1607).

5. While applicants' witnesses continue to interpret and reinterpret data so as to disagree with the authors of the studies showing adverse effects on children through causing cancer, they are unable to conclude that there are no adverse health effects from electromagnetic fields. (Tr. 1659 - 62).

6. While contending they have two basis to conclude EMF is a problem, the applicant failed to produce testimony as to the developing evidence showing that electromagnetic fields influence the body through the magnetite (iron of a magnetic nature) located in the human body. Gelman X-Exam (R. 1108).

7. As stated by OCA witness Janes, it is impossible to properly decide on a course of action, when confronted with the risk, without also considering the benefit. (R. 1617 - 18).

8. In order to make a rational judgment as to the appropriate action concerning the proposed line, it is essential that the Commission reopen the remainder of the proceeding, such that the question of need and alternatives will be considered. 52 Pa. Code Sec. 57.72.

9. The OTS was denied an opportunity to obtain and present testimony, in that the time frame allowed by the Commission was too short for the OTS to get approval and hire an expert.


III. CONCLUSIONS

1. The record shows unqualified risks, no benefits and thus

no basis to allow the applicant to proceed.

2. It is concluded and recommended that the Commission should order a full reopening of the proceedings and remand to the ALJ.

3. In view of the heavy financial burdens proposed on the protestants, and the adverse property damages to be visited upon them, the Commission should direct that the utility compensate the protestants, paying \$100,000 for the development and prosecution of their case to date, and to be drawn upon for future participation, including counsel and expert fees.



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CERTIFICATE OF SERVICE

I, Robert J. Sugarman, certify that I have mailed a copy of the foregoing Protestants' Proposed Findings of Fact and Conclusions of Law to the following counsel by first class mail postage pre-paid on this date:

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**Via Telecopier

Date:

6/16/53


ROBERT J. SUGARMAN



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17105-3265

ORIGINAL

June 22, 1993

IN REPLY PLEASE
REFER TO OUR FILE

John G. Alford, Secretary
Pa. Public Utility Commission
Post Office Box 3265
Harrisburg, PA 17105-3265

Re: Letter Notification of the Philadelphia
Electric Company Relative to Reconductoring
and Rebuilding of the Existing 138 kV Line
to Operate as the Woodbourne-Heatong 230
kV Line; Docket No. A-110550F055

Dear Secretary Alford:

Enclosed, please find an original and nine (9)
copies of the Reply Brief On Remand of the Office of Trial
Staff, for filing in the above-docketed proceeding. Copies
of this Reply Brief are being served on all active parties
of record.

Very truly yours,

Kandace F. Melillo

Kandace F. Melillo
Prosecutor
Office of Trial Staff

Enclosure

KFM:gdp

cc: Honorable Herbert S. Smolen, ALJ
Parties of Record

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PENNSYLVANIA PUBLIC UTILITY COMMISSION
BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

Letter of Notification of :
Philadelphia Electric Company :
Relative to Reconstruction and :
Rebuilding of the Existing :
138 kV Line to Operate as the :
Woodbourne-Heaton 230 kV Line :
in Montgomery and Bucks :
Counties :

Docket No.
A-110550F055

REPLY BRIEF ON REMAND
OF THE
OFFICE OF TRIAL STAFF

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Dated: June 22, 1993

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I. INTRODUCTION

On August 19, 1992, Administrative Law Judge (ALJ) Smolen issued an Initial Decision in this proceeding concerning a Notice to the Commission by Philadelphia Electric Company (PECO) relating to the reconstruction and reconductoring of an existing 138 Kv line to operate as a 230 kV line (Woodbourne-Heaton 230 kV line). The Initial Decision, which was in response to a Remand Order of the Commonwealth Court, considered evidence as to electromagnetic field ("EMF") health effects and land use impacts in determining whether or not the Woodbourne-Heaton line should be energized. Exceptions and Reply Exceptions were filed by various parties to the proceeding. The Office of Trial Staff (OTS), which ordinarily does not file exceptions to ALJ Decisions in cases in which OTS does not participate as a party, was compelled to file exceptions limited to those areas which could be interpreted as constituting a generic ruling on EMF health effects.

By Opinion and Order entered March 26, 1993, the Commission remanded this proceeding to the Office of Administrative Law Judge for the purpose of (1) receiving evidence and comment regarding all studies of the health effects of magnetic fields which are available on or before the hearings on that evidence commence; and (2) determining, in light of findings regarding health effects, what, if any, standards should exist for right-of-way width for the

Woodbourne-Heaton 230 kV line. The ALJ was directed, in this Remand Order, to issue a supplemental decision within 120 days of March 26th. OTS was granted leave to participate nunc pro tunc.

A prehearing conference was held in this remand proceeding on March 31, 1993. OTS expressed grave concerns at that time that the hearing schedule imposed by the Commission would not allow sufficient time for OTS to secure the necessary governmental approvals to hire an expert on EMF health effects. OTS did make every effort to secure a witness during this limited time frame, but was ultimately unsuccessful. When it became clear that additional time was absolutely necessary, OTS sought to obtain an extension of the 120 days. OTS's request was denied by the Commission, by Order entered June 10, 1993.

Since OTS was not provided a full and fair opportunity to present its position on this remanded proceeding, despite being given leave to participate "nunc pro tunc," OTS had originally decided to withdraw from the case. However, upon receiving and reviewing copies of the Main Briefs filed by various parties to this proceeding, OTS now believes that its continued participation is necessary and proper in furtherance of its statutory duty to protect the public interest.

II. ARGUMENT

- A. The Woodbourne-Heaton Proceeding Is Not The Appropriate Proceeding For The ALJ And The Commission To Reach Definitive Conclusions Concerning The Scientific Evidence As It Relates to EMF Health Effects.

On September 11, 1991, Metropolitan Edison Company ("Met-Ed"), Pennsylvania Electric Company ("Penelec"), Jersey Central Power & Light Company ("Jersey Central"), and Duquesne Light Company ("Duquesne") filed a Siting Application with the Commission, at Docket No. A-110300F051, for authorization to construct a 268-mile 500 kV transmission line (DQE/GPU transmission line). To date, more than 9,400 informal and Formal Complaints and protests have been filed by persons and entities opposing construction of the line. Some of these Complainants also sought intervenor status in the earlier-filed companion proceeding at consolidated docket numbers G-900240, P-900485, and P-910502 (Transaction proceeding). In denying the intervention requests, the Commission assured these individuals that they would have a full, fair and complete opportunity to litigate, inter alia, issues of health and safety concerning the proposed 500 kV line. See, Commission Opinion and Order at G-900240, et al., entered March 16, 1992, p. 20; see also, Commission Opinion and Order at G-900240, et al., entered April 2, 1992, pp. 53-55.

Despite these previous assurances, the Commission now appears to be contemplating that the instant Woodbourne-Heaton

proceeding may be the case in which to definitively rule on the EMF health effects issue. See, Commission Opinion and Order entered June 10, 1993, Docket No. A-110550F055, p. 6. For the reasons stated herein, the ALJ and the Commission should unquestionably decline to make any general conclusions in the instant proceeding about the state of the existing scientific evidence as it relates to EMF health effects. To definitively decide the issue of EMF health effects in this proceeding would violate previous Commission assurances in the "Transaction proceeding" and would also effectively deny due process to thousands of Pennsylvania citizens currently fighting the DQE/GPU transmission line on the basis of, inter alia, adverse health effects. The ALJ and the Commission do not need to reach definitive conclusions for all time in this proceeding about EMF health effects. Instead, any findings and conclusions should be limited to the evidence of record, in accordance with burden of proof standards.

OTS strongly disagrees that the Woodbourne-Heaton proceeding may be as appropriate a proceeding to consider the extremely controversial issue of EMF health affects as the DQE/GPU proceeding. Instead, OTS agrees with and supports the statement of ALJ Smolen at page 11 of the Initial Decision,

issued August 19, 1992, wherein the ALJ clearly and concisely defines the appropriate scope of the instant proceeding:^{1/}

Thus, the Administrative Law Judge must determine whether the record evidence presented by the parties is sufficient to support a finding that Petitioners will be adversely affected by the reconductoring of the line at issue. It is not, repeat, not to scientifically determine, one way or the other, for all time, whether EMFs cause or contribute to adverse human health effects. It is however, as aforesaid, to determine within the framework of the record adduced in this particular case, whether or not there is sufficient record evidence to support a finding that Petitioners will be adversely affected by the reconductoring of the line at issue. (Emphasis in original).

There are numerous reasons why this proceeding is not the appropriate vehicle for a generic determination on EMF health effects. First and foremost are due process considerations in that thousands of Pennsylvanians who are either actively involved now in opposing transmission line siting applications or who would be involved if provided the opportunity have not been given notice that the Commission intends to reach definitive conclusions about EMF scientific evidence in the instant proceeding. All of these individuals could potentially be effected and bound by these conclusions in

^{1/} Certain findings of fact in the Initial Decision of ALJ Smolen, issued August 19, 1992, go beyond this delineated scope of the proceeding, and OTS has excepted to these findings on that basis. See, OTS Exceptions at Docket No. A-110550F055, filed September 8, 1992, incorporated herein by reference.

ongoing and future litigation and yet would not have been provided the opportunity to present their evidence.

Other reasons supporting forbearance from definitive EMF conclusions in this proceeding is that the EMF health issues are being extensively litigated in the DQE/GPU transmission line proceeding. That case is more in the nature of a generic proceeding on EMF than is the instant case due to the vast number of parties in the DQE/GPU case and its broader state impact.^{2/}

Considerable resources are being expended in the DQE/GPU proceeding to provide a full spectrum of expert opinions on the EMF health question. In addition, the position statements of the utilities' EMF health witnesses have already been extensively challenged in that proceeding through cross-examination. OTS itself cross-examined the utilities' epidemiologist for 17 hours and their oncologist for 10 hours during all or parts of eight (8) days of hearings (February 25, 26; March 11, 12; April 22, 23; May 3, 11, 1993). Other parties also cross-examined these two witnesses, who were on the stand for all or parts of nine (9) days in total. The Swedish studies alone were the subject of cross-examination for

^{2/} The DQE/GPU transmission line is a 500 kV line, 268 miles long, traverses 14 Pennsylvania counties, and requires acquisition of new right-of-way for half of its length. In contrast, the Woodbourne-Heaton line is a 230 kV line, 13 miles long, traverses two Pennsylvania counties, and is to be reconductored within a wider, existing utility corridor.

several hours. All this effort could be for naught if the Commission decides to make generic determinations on EMF health effects in the Woodbourne-Heaton proceeding.

In contrast, the instant proceeding, particularly the remand proceeding (which was specifically for the purpose of considering the new Swedish studies and other recent studies), simply does not provide the full spectrum of expert scientific opinion which will be provided in the GPU/DQE proceeding. Also, as indicated in PECO's Initial Brief On Remand, only two witnesses in this proceeding discussed the Swedish residential study and only one of those witnesses (i.e., PECO's witness) was an epidemiologist. PECO Initial Br. on Remand, p. 20. Thus, the ALJ and the Commission will only have the testimony of one epidemiologist (the utility's witness) to consider if they choose to make definitive conclusions about the Swedish studies in this proceeding. OTS intended to present the testimony of Dr. Samuel Milham, a pioneer in the field of EMF epidemiology,^{3/} but was denied that opportunity due to time constraints imposed in the remand proceeding. The ALJ and the Commission should unquestionably have the benefit of a non-utility witness epidemiologist, since one is available to

^{3/} Dr. Milham was one of the first epidemiologists to publish data indicating an EMF/cancer association. See, e.g., Milham S. (1982) Mortality From Leukemia In Workers Exposed To Electrical and Magnetic Fields, 307(4) New England Journal of Medicine, p. 249.

be presented, when considering a subject as sensitive and as important to the public interest as adverse EMF health affects.

Dr Milham's testimony will be presented by OTS in the DOE/GPU proceeding. While OTS did not have the requisite approval to retain Dr. Milham in time to file testimony by the May 12th deadline in Woodbourne-Heaton, OTS has now, ironically, received the requisite approval to retain Dr. Milham as an expert in this proceeding (as of May 27, 1993) and could file his testimony if given the opportunity. Based on Dr. Milham's testimony in prior proceedings and on his anticipated testimony (to be filed July 6) in the DOE/GPU case, it can be stated unequivocally that Dr. Milham would provide a different prospective and reach different conclusions on the Swedish studies than has previously been presented by other witnesses.^{4/} The ALJ and the Commission must consider whether or not it is in the public interest to definitively decide EMF health questions without having a complete record to provide the full spectrum of scientific expert opinion on the subject. In OTS's opinion, the public interest requires a full range of all expert opinions of record for consideration.

For all of the above reasons, the ALJ and the Commission should refrain from making definitive findings and conclusions in the Woodbourne-Heaton proceeding which could be

^{4/} PECO's disingenuous statement (made in response to OTS's request for reconsideration of Order entered March 26, 1993) that OTS's witness would add little to the proceeding is patently false!

interpreted as "prejudging" the EMF health effects issue and which could be used to attack the positions of witnesses and parties in other on-going and future transmission line siting proceedings. Accordingly, the following findings of fact and conclusions of law, which are proposed in the Main Briefs On Remand of various parties in this proceeding, should not be adopted:

PECO Initial Brief on Remand

Proposed Findings of Fact numbers 5 through 10 of PECO's Initial Brief on Remand should not be adopted as stated by PECO. Each of these proposed findings relate to the new Swedish residential study conducted by Feychting and Ahlbom, which has already been the subject of extensive testimony and cross-examination in the DQE/GPU proceeding. As previously stated, proposed findings 5 through 10 are being requested in a proceeding in which only one epidemiologist testified: the utility's retained epidemiologist Dr. Cole. OTS's retained epidemiologist Dr. Milham, who was hired to represent the public interest, was not given the opportunity to testify and his views are not reflected on this record! If PECO's requested findings concerning the Swedish residential study are to be reflected in this proceeding at all, they should be rephrased so as not to reflect definitive final statements of the Commission concerning this study. Accordingly, proposed findings of fact 5 through 10 should all be prefaced with the phrase "based on the evidence provided in this proceeding...."

In addition, proposed finding of fact number 5, which, inter alia, requests a negative or null finding for "all childhood cancers" in the Feychting/Ahlbom study, is extremely misleading and should not be adopted in any form.

Findings of fact numbers 11 and 12 and proposed conclusions of law number 1 should also not be adopted as stated by PECO since these proposed findings and conclusions could be used to attack requested findings and calculations concerning EMF in other pending proceedings. If these proposed findings and conclusions are to be reflected in this proceeding at all, they also should be rephrased so as not to contain definitive final statements of the Commission concerning EMF health effects. All of these proposed findings and conclusions would need to be prefaced with the phrase "based on the evidence provided in this proceeding...."

Main Brief on Remand of PP&L

Proposed findings of fact numbers 1 through 3 of PP&L's Main Brief on Remand should not be adopted as stated by PP&L, for the reasons previously discussed herein. If these proposed findings are to be reflected at all in this proceeding, they should be rephrased so as not to contain definitive final statements of the Commission concerning EMF health effects. All of these proposed findings would need to be prefaced with the phrase "based on the evidence provided in this proceeding...."

Proposed conclusion of law number 5 is not an appropriate conclusion for the instant proceeding. OTS submits that the purpose behind this requested conclusion may be self-serving as PP&L has at least one highly-contentious siting proceeding pending at the present time before the Commission. (Hoffman-Minooka 138 kV line - Docket No. A-110500F0172 et al.). A determination as to the appropriate regulatory response in pending and future line siting applications must await determination in these cases, not the current proceeding.

Brief On Remand of the
Commission Law Bureau

Proposed findings of fact numbers 18 through 25 and proposed conclusion of law number 2 should not be adopted as stated by the Commission's Law Bureau, for the reasons stated herein. In particular, findings of fact numbers 19 through 21 constitute definite pronouncements about the science based on one-sided opinions. If these proposed findings and conclusions are to be reflected at all in this proceeding, they should be rephrased so as not to contain definitive final statements of the Commission concerning EMF health effects. All of these proposed findings and conclusions would need to be prefaced with the phrase "based on the evidence provided in this proceeding...."

Office of Consumer Advocate
Brief on Remand

Proposed findings of fact numbers 1 through 8 should be modified to reflect that these proposed findings are based on the evidence provided in this proceeding. Proposed findings of fact numbers 10 and 11 should not be adopted as stated by the OCA since they involve definitive pronouncements on the existing state of the EMF scientific evidence. Accordingly, these proposed findings, if reflected at all, should also be prefaced with the phrase "based on the evidence provided in this proceeding...."

- B. Any Right-Of-Way Standards To Be Adopted In This Proceeding Should Be Applicable To The Woodbourne-Heaton Line Only.

For the reasons previously stated in Section II.A. of this Reply Brief, any adoption of right-of-way standards should be applicable only to the Woodbourne-Heaton line involved in this proceeding. If the adoption or refusal to adopt right-of-way standards are stated to be in response to health effects, it must be made clear that the health effects being responded to are based on the record of this proceeding.

III. CONCLUSION

For all the foregoing reasons, OTS respectfully requests that the ALJ and the Commission decline to make definitive conclusions in this proceeding concerning the scientific evidence as it relates to EMF health effects. In addition, any right-of-way standards to be adopted in this proceeding should be only applicable to the Woodbourne-Heaton line.

Respectfully submitted,

Kandace F. Melillo
Charles F. Hoffman
Chief Counsel

Robert F. Frazier
Senior Prosecutor

Kandace F. Melillo
Prosecutor

Office of Trial Staff

Pennsylvania Public Utility Commission
P. O. Box 3265
Harrisburg, PA 17105-3265
(717) 787-4886

Dated: June 22, 1993

CERTIFICATE OF SERVICE

I hereby certify that I am serving the foregoing document(s), either personally, by Facsimile, and/or by Overnight/Express or First Class mail, upon the persons listed below:

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Kandace F. Melillo
Prosecutor - Office of Trial Staff
Pennsylvania Public Utility Commission

Dated: June 22, 1993
Woodbourne/Heaton, A-110550F055



COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17105-3265

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June 22, 1993

IN REPLY PLEASE
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John G. Alford, Secretary
Pa. Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Letter of Notification of
Philadelphia Electric Company
Relative to the Reconstructing
and Rebuilding of the Existing
Conrail 138kV Line to Operate
as the Woodbourne-Heaton 230kV
Line, Docket No. A-110550,F055

Dear Mr. Alford:

Please find enclosed the original and ten copies of the document Reply Brief on Remand of the Commission Law Bureau Prosecutory Staff. A copy of the certificate of service is attached to each brief.

Respectfully,

Patricia Krise Burket
Assistant Counsel

cc: ALJ Herbert Smolen
All parties

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PENNSYLVANIA PUBLIC UTILITY COMMISSION
BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

Letter of Notification of
Philadelphia Electric Company
Relative to the Reconstructing
and Rebuilding of the Existing
138kV Line to Operate as the
Woodbourne-Heaton 230kV Line in
Montgomery and Bucks Counties.

Docket No.
A-110550
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REPLY BRIEF ON REMAND
OF THE
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PROSECUTORY STAFF

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DATED: June 22, 1993

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I. THE PROTESTANTS' PROPOSED FINDINGS OF FACT ARE UNSUPPORTED BY RECORD EVIDENCE

Administrative Law Judge (ALJ) Herbert Smolen's June 4, 1993 order establishing a briefing schedule in this remand proceeding explicitly provided that briefs must include proposed Findings of Fact with exhibit and/or transcript references. Because no record references are provided by Protestants to support their proposed Findings of Fact Nos. 2, 8 and 9, these findings are per se defective and should be disregarded.

The Prosecutory Staff submits that the rest of the Protestants' proposed findings, which by and large represent the antithesis of findings proposed by the Prosecutory Staff, PECO and OCA in their main briefs, are not supported and are in fact overwhelmingly contradicted by substantial record evidence. We will specifically address Protestants' proposed Findings Nos. 1, 3 and 6 below.

Protestants first proposed Finding of Fact reads as follows:

1. The Protestants lack resources to provide additional expertise to evaluate and comment on the present state of research into electromagnetic fields impact (Counsel Tr. 1704).

Protestants Brief, p. 2.

The Prosecutory Staff notes that the supporting evidence referenced for this finding is a statement made by Protestants' Counsel Robert J. Sugarman at pages 1706 to 1707 of the transcript. As Mr. Sugarman's statements were unsworn, and the financial conditions of the Protestants were unverified by

supporting documentation, the ALJ should decline to adopt Protestants' proposed finding.

Protestants' third proposed Finding of Fact reads as follows:

3. The OCA produced witnesses who refused to opine as to appropriate mitigation measures (Tr. _____ (sic) 1616-1618).

Protestants' Brief, p. 2.

A fair reading of the record will show that the OCA witness David Janes did not refuse "to opine" regarding appropriate mitigation measures for the Woodbourne-Heaton 230kV Line. Janes, in fact, did offer his expert opinion about the mitigation measure which the Commission directed be considered in this remand proceeding -- electromagnetic field standards or right-of-way width standards. Janes indicated that a health-based standard for EMF could not be adopted at this time because the uncertainties about the effects of EMF were too great (OCA Statement 1B, p. 11). He recommended that the Commission not set a right-of-way standard for the Woodbourne-Heaton 230kV Line (N.T. p. 1627). As the Protestants' proposed Finding of Fact No. 3 is not supported by substantial record evidence, the ALJ should refuse to adopt it.

Protestants' sixth proposed Finding of Fact reads as follows:

6. While contending they have a basis to conclude EMF is a problem, the applicant failed to produce testimony as to the developing evidence showing that electromagnetic fields influence the body through the magnetite (iron of a

magnetic nature) located in the human body. Gelman (sic) X-Exam (R. 1108).

Protestants' Brief, p. 3.

The Prosecutory Staff notes the record reference is faulty and that Dr. Edward Gelmann's most recent oral testimony in this proceeding appears at N.T. pp. 1703-1708. At these pages of testimony, Gelmann testified he was not familiar with a study which was presented during the previous week to the American Geophysical Union involving epilepsy patients exposed to weak magnetic fields as reported in the May 31, 1993 Philadelphia Inquirer (N.T. pp. 1703-1704). He did note, however, that he had read some papers on the potential of alteration of cells or subsets of cells through the interaction of magnetic fields and magnetites in the body (N.T. p. 1704). Gelmann then testified that his conclusion that "scientific research provides no basis to conclude that power frequency fields cause, promote or otherwise contribute to the development of cancer or other adverse health effects" did include at least one study on magnetite (N.T. p. 1705). Gelmann testified further that he was not confident that there is a feasible mechanism for EMF and cancer involving magnetite because to his knowledge there is no relationship between magnetite and the functioning of RNA (N.T. p. 1708). The Protestants' proposed finding is, thus, contradicted by record testimony.

Additionally, Prosecutory Staff notes that the Protestants' Counsel cannot testify on matters in this proceeding. ALJ Smolen expressly stated that Mr. Sugarman's

cross-examination questions about the information contained in the May 31, 1993 Philadelphia Inquirer article about magnetic fields and epilepsy were not evidence in this proceeding (N.T. p. 1703). Furthermore, the mere existence of a report on a study involving epileptic patients and weak magnetic fields in a daily newspaper is not substantial evidence to support the proposed finding which implies that the instant record is deficient in that research area. Since the record clearly demonstrates that the Applicant PECO did provide record testimony disputing a link between EMF and cancer involving magnetite in the human body, the ALJ should refuse to adopt the Protestants' proposed Finding of Fact No. 6.

II. NEED FOR THE WOODBOURNE-HEATON 230 KV LINE IS SUPPORTED BY SUBSTANTIAL RECORD EVIDENCE

At page 1 of the Protestants' Brief under the heading

"I. History", Protestants state the following:

1. The need and necessity of the line has never been determined on a record, since no hearings were held prior to the initial approval granted in March 1990.

The Prosecutory Staff respectfully disagrees. While it is true that no witness presented evidence at hearing of need for the line, it is not true that the Commission record does not contain evidence of need for the line, nor that PECO did not consider need for the line prior to filing its November 21, 1989 Letter of Notification.

Under "Engineering Justification of the Design of the Line", PECO states in its Letter of Notification regarding need for the line that:

[o]ne new distribution substation of particular concern is Linton. This 230-34.5 kV substation, which will be in service for the 1990 summer peak, will be installed on the existing 230 kV line between Buckingham and Woodbourne. It will have the firm capacity to supply approximately 120 MVA of load. Unlike Woodbourne, Linton will have no 34.5 kV network support. Linton will depend entirely on the transmission systems for its supply. In the event of an outage of the 230 kV line between Buckingham and Linton, without the Woodbourne-Heaton 230 kV line, the supply for both Woodbourne and Linton 230 kV substations will have to come from the 138 kV system at Byberry. This outage could cause emergency overloads on the 138 kV system and severe voltage drops throughout the area.

Although the Crescentville-Fox Chase 138 kV (130-24) is being upgraded to provide an emergency rating, approximately 75 MVA higher than is now in effect, this is only stop-gap measure. Unless the Woodbourne-Heaton 230 kV line is installed, load growth at Linton and Woodbourne will soon cause emergency overloads on either the Crescentville-Fox Chase 138 kV line or the Fox Chase-Blue Grass 138 kV line for the loss of the Buckingham-Linton 230 kV line.

An additional problem caused by trying to supply Linton and Woodbourne from the 138 kV system is voltage drops. Previous load-flow studies indicate that the outage of the Buckingham-Linton 230 kV line could result in a voltage drop of 8 percent on the 230 kV bus at Linton and as much as 10 percent on the 34.5 kV bus at Linton. Installation of the Heaton-Woodbourne 230 kV line would restrict these voltage drops to the 1 to 1.5 percent range.

PECO's Letter of Notification, pp. 8-9.

Under "Engineering Justification of the Design of the Line", PECO states in its Letter of Notification regarding need for the line that:

[o]ne new distribution substation of particular concern is Linton. This 230-34.5 kV substation, which will be in service for the 1990 summer peak, will be installed on the existing 230 kV line between Buckingham and Woodbourne. It will have the firm capacity to supply approximately 120 MVA of load. Unlike Woodbourne, Linton will have no 34.5 kV network support. Linton will depend entirely on the transmission systems for its supply. In the event of an outage of the 230 kV line between Buckingham and Linton, without the Woodbourne-Heaton 230 kV line, the supply for both Woodbourne and Linton 230 kV substations will have to come from the 138 kV system at Byberry. This outage could cause emergency overloads on the 138 kV system and severe voltage drops throughout the area.

Although the Crescentville-Fox Chase 138 kV (130-24) is being upgraded to provide an emergency rating, approximately 75 MVA higher than is now in effect, this is only stop-gap measure. Unless the Woodbourne-Heaton 230 kV line is installed, load growth at Linton and Woodbourne will soon cause emergency overloads on either the Crescentville-Fox Chase 138 kV line or the Fox Chase-Blue Grass 138 kV line for the loss of the Buckingham-Linton 230 kV line.

An additional problem caused by trying to supply Linton and Woodbourne from the 138 kV system is voltage drops. Previous load-flow studies indicate that the outage of the Buckingham-Linton 230 kV line could result in a voltage drop of 8 percent on the 230 kV bus at Linton and as much as 10 percent on the 34.5 kV bus at Linton. Installation of the Heaton-Woodbourne 230 kV line would restrict these voltage drops to the 1 to 1.5 percent range.

PECO's Letter of Notification, pp. 8-9.

It is clear that the Commission also considered evidence of need for the Woodbourne-Heaton 230kV Line submitted by PECO in support of its Letter of Notification in its February 3, 1990 order :

PECO states that the area served by its existing Warrington, Buckingham, Woodbourne, Byberry and Heaton 230-34.5 KV substations is one of the fastest growing load areas on its system. In the three-year period from summer 1985 to summer 1988, the load on the 34.5 KV subtransmission system in this area grew by more than 32% (as compared to 13% for the PECO system as a whole). This very high load growth has precipitated both the expansion of existing distribution facilities as well as the construction of new distribution substations, including the Linton 230-34.5 KV distribution substation, which is scheduled to be in service for the 1990 summer peak.

However, the high load growth has also precipitated some potential electrical problems. A case in point is the new Linton substation which is to be supplied by the Buckingham substation. Unlike Woodbourne, the Linton substation will have no 34.5 KV network support, but will depend entirely on the transmission system for its supply. In the event of an outage of that portion of the Buckingham-Woodbourne 230 KV line between Buckingham and Linton, the supply for both the Linton and Woodbourne 230-34.5 KV substations will have to come from the 138 KV transmission system via the Byberry substation. However, load flow studies indicate that this outage scenario could cause emergency overloads on the 138 KV system and severe voltage drops throughout the area.

Consequently, pursuant to this Letter of Notification, PECO proposes to construct a 12.8 mile, 230 KV single-circuit transmission line between the Woodbourne and Heaton substations. This proposed transmission line will provide a second source of 230 KV supply for both the Woodbourne and Linton substations, thus preventing line overloads

and low voltage conditions in the event of an outage of the Buckingham-Linton 230 KV line segment.

Order entered February 3, 1990 at Docket No. A-110550, F.055, pp. 1-2.

As demonstrated above, evidence in support of need for the Woodbourne-Heaton 230 kV Line was submitted by PECO in this proceeding, and considered by the Commission in its February 3, 1990 order approving PECO's Letter of Notification. The Protestants' argument to the contrary is wrong!

III. JUDGE PALLADINO'S MAY 24, 1991 ORDER DID NOT REQUIRE THE COMMISSION TO DO ANYTHING FURTHER THAN TO PROVIDE PROTESTANTS WITH THE OPPORTUNITY FOR A HEARING ON WHETHER THEY WOULD BE ADVERSELY AFFECTED BY THE RECONDUCTORING OF THE 138KV CONRAIL LINE AS PECO'S WOODBOURNE-HEATON 230KV LINE

Although the Commission limited this proceeding to two matters -- consideration of more recent EMF research and the establishment of possible EMF standards for the Woodbourne-Heaton line -- the Protestants continue to reargue old issues.

At p. 1 of the Protestants' Brief under a heading labelled "I. History", Protestants allege that:

3. The Commonwealth Court, per Judge Palladino, held that the Commission had denied notice and thus, an opportunity for a hearing, and required that the Commission reopen the case. (No. 761 C.D. 1991, May 24, 1991).
4. Despite the finding that the order was invalid, the Commission did not appeal (nor did applicant) but the Commission limited its reopening initially to the issue of effect on the protestants. (June 14, 1991).

The Prosecutory Staff answers these arguments as it has done previously. See, Prosecutory Staff Reply Brief, p. 6. First, Judge Palladino in her June 14, 1991 order (copy attached as Annex A) did not order the Commission to reopen the proceeding for a full hearing. The Judge ordered that the Commission provide the Protestants with an opportunity for hearing on how they would be adversely affected by the energization of the Woodbourne-Heaton 230kV Line (Order, p. 2).^{1/} In its June 14, 1991 order, the Commission expressly followed this instruction.

In compliance with the Judge's order issued May 24, 1991, the Commission directs that the record at Docket No. A-110550,F.055 be reopened so that the [Protestants] can at hearing introduce testimony and evidence on the sole issue of whether the Petitioners will be adversely affected by the reconductoring of this former Conrail line as PECO's Woodbourne-Heaton 230kV Line.

Commission Order entered June 14, 1993 at Docket No. A-110550,F.055, p. 2.

A copy of the Commission's June 14, 1991 order is attached as Annex B to this brief.

Second, any injury to Protestants' individual due process rights caused by lack of notice of PECO's original filing has already been cured by the Commission's implementation of the

^{1/} In her May 24, 1992 order, Judge Palladino stated that:

This Court concludes that Petitioners are entitled to a hearing on the question of whether they will be adversely affected by the reconductoring of the high tension electrical line at issue in this case.

Small v. Pa. PUC, order entered May 24, 1992 at 761 C.D. 1991 at p. 2.

remedy prescribed in Judge Palladino's May 24, 1991 order -- to allow the Protestants to have a hearing to present evidence on how they would be adversely affected by PECO Woodbourne-Heaton 230kV Line. Further hearings for the examination of need for this line are not required by Judge Palladino's order.

The Protestants contend, however, that they have:

amply demonstrated severe adverse affect on them as a result of their reasonable concerns about potential health impacts, as determined by the ALJ, and affirmed by the Commission. . .

Protestants' Brief at p. 2.

Protestants then complain that:

[n]evertheless, the Commission continued to decline to allow hearings on the need for the line, and alternatives to it. . .

Protestants' Brief at p. 2.^{2/}

Protestants then conclude and request that the Commission should order a full reopening of the proceeding. Protestants' Brief at p. 4.

In answer, the Prosecutory Staff submits that the ability of the ALJ to make a recommendation to grant the relief requested by the Protestants is clearly outside the scope of the remand proceeding as ordered by the Commission's March 26, 1993 order. If, however, the ALJ does believe that he has the authority to entertain this request, we ask that the ALJ consider

^{2/} The Prosecutory Staff notes that a utility filing a letter of notification, which is the application under consideration in this proceeding, is not required to include information about alternative routes. 52 Pa. Code §57.72(d).

the standards for the rehearing and reopening of a Commission proceeding as set forth in Duick v. Pa. Gas & Water Co., 56 Pa. PUC 553 (1982). In deliberating whether to grant the Protestants' request for reopening of this proceeding for further hearing, we would ask that the ALJ take into account the arguments raised on this issue in our Exceptions filed September 8, 1992, pp. 1-23, and reconsider the conclusion of law he reached in his August 19, 1992 Initial Decision that fear of electromagnetic fields is reasonable. Initial Decision, entered August 19, 1992 at Docket No. A-110550,F.055 at p. 197.

IV. THE COMMISSION IS NOT LEGALLY AUTHORIZED TO AWARD ATTORNEY FEES TO THE PROTESTANTS

3. Under the heading "Conclusions" of the Protestants' Brief, it is stated that:

[i]n view of the heavy financial burdens proposed on the protestants and the adverse property damages to be visited upon them, the Commission should direct that the utility compensate the protestants, paying \$100,000 for the development and prosecution of their case to date, and to be drawn upon for future participation and expert fees.

Protestants' Brief, p. 4.

Although the issue of attorneys' fees is outside the scope of this proceeding, the Prosecutory Staff, nevertheless, believes that we should address the issue at this time. The award of attorneys' fees to the Protestants is an extraordinary remedy which the Commission is not authorized to grant under Pennsylvania or Federal law.

In general, in situations where the assessment and/or award of damages has been requested by persons alleging unreasonable public utility service or facilities under 66 Pa. C.S. §1501, the Pennsylvania Supreme Court has determined that the Commission has no authority to award damages. Feingold v. Bell Telephone Co. of Pa., 477 Pa. 1, 383 A.2d 791 (1977); Elkin v. Bell Telephone Co. of Pa., 49 Pa. 123, 420 A.2d 371 (1980).

Commission's siting regulations, 52 Pa. Code §§57.71, et seq., pursuant to which PECO's Letter of Notification for the Woodbourne-Heaton 230kV Line was filed, were promulgated under Sections 401 and 412 of the Public Utility Law, May 28, 1937, P.L. 1053, No. 286, now 66 Pa. Code §1501 and §1504 of the present Public Utility Code. Accordingly, under the aforecited case law, the Protestants' request for attorneys' fees, which may be construed as a request for damages under Sections 1501 and 1504 of the Public Utility Code, is outside the scope of Commission authority to grant, and should be denied.^{3/}

The Judicial Code, 42 Pa. C.S. §2503, which applies only to the components of the unified judicial system of which the Commission is not a part, does not authorize the Commission to award attorneys' fees. See, Duquesne Light Company v. Pa. PUC, 117 Pa. Commonwealth Ct. 28, 543 A.2d 196 (1988), appeal

^{3/} The Protestants' request in their May 14, 1993 Formal Statement of Position that PECO should purchase all properties any of which would be within 1 milligauss of magnetic field level more than 5% of the time must also be denied by the Commission based upon the above rationale. See also, Prosecutory Staff's Brief, dated April 20, 1992, pp. 15-23.

granted, 521 Pa. 632, 558 A.2d 533 (1989). See also, Pleasant Valley School District v. Department of Community Affairs, 127 Pa. Commonwealth Ct. 85, 560 A.2d 935 (1980).

Federal law, specifically the Public Utility Regulatory Policy Act (PURPA), 16 U.S.C. §§2601, et seq., does not provide a basis upon which the Commission can require PECO to pay the attorneys' fees of the Protestants. The specific PURPA section dealing with attorneys' fees, 16 U.S.C. §2632(a)(1), reads as follows:

§2632 Consumer representation.

(a) Compensation for costs of participation or intervention.

(1) If no alternative means for assuring representation of electric consumers is adopted in accordance with subsection (b) of this section and if an electric consumer of an electric utility substantially contributed to the approval, in whole or in part, of a position advocated by such consumer in a proceeding concerning such utility, and relating to any standard set forth in subchapter II of this chapter, such utility shall be liable to compensate such consumer (pursuant to paragraph (2)) for reasonable attorneys' fees, expert witness fees, and other reasonable costs incurred in preparation and advocacy of such position in such proceeding (including fees and costs of obtaining judicial review of any determination made in such proceeding with respect to such position).

16 U.S.C. §2632 (emphasis added).

The Prosecutory Staff notes that this statute is inapplicable to the instant proceeding as the issues involved in PECO's Woodbourne-Heaton Letter of Notification do not relate to any standard set out in Subchapter II of Chapter 46, 16 U.S.C.

§§2621-2627. Standards set out in Subchapter II generally relate to rate matters. See also, Pa. Public Utility Commission v. Duquesne Light Co., (Docket No. R-811470) 61 Pa. PUC 485 (1986) in which the Commission rejected an intervenor's petition for attorneys' fees. Although the Commission determined it was without statutory authority to award attorney fees, the Commission relied on 16 U.S.C. §2632(a) for guidance from a policy stand-point. The Commission determined that the presence of the Office of Consumer Advocate in Pennsylvania provides an alternate means of compensating persons representing an interest in Commission proceedings which exempts Pennsylvania from the provisions of 16 U.S.C. §2632(a).^{4/}

V. CONSTRUCTIVE NOTICE OF COMMISSION CHAPTER 57 FILINGS BY NEWSPAPER PUBLICATION AS ADOPTED BY THE COMMISSION PROVIDES SUFFICIENT AND BROAD NOTICE TO ALL PROPERTY OWNERS IN A PROPOSED TRANSMISSION LINE CORRIDOR, THUS ELIMINATING THE DIFFICULTY IN DEFINING THE TERM "ADJACENT PROPERTY OWNERS"

Counsel for the Office of Consumer Advocate (OCA) once again advises that the Commission should ensure "that further applicants provide actual notice to affected property owners" OCA's Main Brief on Remand, p. 17. OCA does not define "affected property owners." OCA counsel then references their Main Brief at pp. 55-58, where they had requested that the Commission amend

^{4/} The Commission's order in this matter was affirmed on other grounds by Commonwealth Court in Duquesne Light Co. v. Pa. P.U.C. cited previously on p. 11 of this brief.

its siting regulations so as to provide for more comprehensive actual notice to adjacent property owners. OCA counsel did not define the term "adjacent property owners", nor did they suggest the form which such notice should take.

Although we believe that the OCA's request for amendment of the notice provisions of the siting regulations is outside the scope of this remand proceeding, we will answer the request through incorporating by reference the arguments against such action which we made in our May 11, 1992 Reply Brief at pp. 1-3. Additionally, the Prosecutory Staff believes as it did then:

[that] the newspaper publication requirement [adopted by the Commission in connection with a letter of notification filed by West Penn Power Company at Docket No. A-111250, F.038] not only provides notice of the filing to the broadest spectrum of interested individuals, but also eliminates the need to split hairs in defining terms like "adjacent property owners". Considering the problems which have been identified in defining such a term, the Prosecutory Staff believes that providing newspaper notice of Commission transmission line filings is a fairer method of providing notice of such filing to the public.

Prosecutory Staff Reply Brief, pp. 2-3.

VI. THE INITIATION OF A SEPARATE LEGAL PROCEEDING BY THE COMMISSION TO ADDRESS PUBLIC CONCERN ABOUT EMF SHOULD BE DELAYED UNTIL PENDING CASES IN WHICH THE ALLEGED HEALTH EFFECTS OF EMF ARE AT ISSUE ARE RESOLVED

In Pennsylvania Power & Light Company's (PP&L) Main Brief on Remand, PP&L recommends that Commission institute a proceeding which would mandate that all electric utilities in the

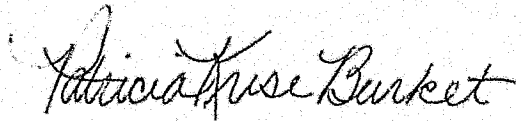
Commonwealth adopt a comprehensive EMF policy. PP&L Main Brief, p. 16. PP&L, however, recommends that the Commission should expressly provide that the institution of such a proceeding would not delay the outcome of applications currently pending or received during the proceeding. PP&L Main Brief on Remand, p. 26.

The Prosecutory Staff does not see that this solution is viable. Those persons protesting pending transmission line applications, who would like to see those proceedings delayed as long as possible, would inundate the Commission with requests based on public policy to stay proceedings on those applications until such an EMF policy proceeding was completed. Similarly, utilities hoping to avoid requirements involving EMF management, which could be imposed on them by an EMF policy proceeding, would flood the Commission with Chapter 57 filings during its pendency.

One possible solution the Prosecutory Staff sees for minimizing the likelihood of such events is for the Commission to direct that any proceeding which may be instituted on EMF policy be completed as quickly as due process permits. The preferable solution, of course, would be to postpone the initiation of such an EMF policy proceeding until the adjudication of currently pending Chapter 57 filings is completed. Such a proceeding, in Prosecutory Staff's opinion should also involve a comprehensive examination and restructuring of the current Chapter 57 siting regulation.

CONCLUSION

WHEREFORE, the Prosecutory Staff respectfully requests that no further hearings be held in this matter and that the Commission reaffirm its February 3, 1990 order approving Philadelphia Electric Company's Letter of Notification in the above-captioned proceeding.


Respectfully submitted,

Patricia Krise Burket
Assistant Counsel

Pa. Public Utility Commission
Law Bureau Prosecutory Staff
P.O. Box 3265
Room G-30, North Office Building
Harrisburg, PA 17105-3265

(717) 783-2810

Dated: June 22, 1993

ANNEX A

Opinion of Judge Madeline Palladino,
Commonwealth Ct. Docket No. 761 C.D. 1991,
May 24, 1991

ROBERT SMALL, FRANK ENGLISH,	:	IN THE COMMONWEALTH COURT
and DIANE P.S. KOERPER, et al.	:	OF PENNSYLVANIA
Petitioners	:	
	:	
v.	:	
	:	
PENNSYLVANIA PUBLIC UTILITY	:	No. 761 C.D. 1991
COMMISSION,	:	Argued: May 22, 1991
Respondent,	:	

BEFORE: HONORABLE MADALINE PALLADINO, Judge


MEMORANDUM OPINION AND ORDER

AND NOW, this 24th day of May 1991, because counsel for Petitioner, during argument on his motion, expressly requested a remand rather than a stay of the construction of the high tension electrical line in question and, additionally requested a hearing before the Public Utility Commission (PUC), this court will consider Petitioner's petition to stay as a petition to remand.

It is clear to the court that the letter notification process of 52 Pa. Code §57.72(d), under which Philadelphia Electric Company proceeded before the PUC, did not contemplate the fact matrix before this court in which an existing right-of-way, previously utilized for rail service, is put to a new use. The notice to entities owning property within the proposed right-of-way provided in 52 Pa. Code §57.72(d) is insufficient, where as here, it is clear that Petitioners, as neighboring property owners, will be affected by the new use of the right of way.¹ Notice to municipalities given pursuant to 52 Pa. Code

¹This court renders no opinion as to whether the landowners will be adversely affected by the reconductoring of the high tension electrical line.

§57.72(c)(11) does not provide the notice and opportunity to be heard to which Petitioners are entitled. This court concludes that Petitioners are entitled to a hearing on the question of whether they will be adversely affected by the reconductoring of the high tension electrical line at issue in this case. Consequently, this court orders this case remanded to the PUC to hold a hearing on this issue within 90 days from the date of this order.


MADALENE PALLADINO, Judge

ANNEX B

Commission Order entered June 14, 1991
at Docket No. A-110550, F055 remanding
proceeding on Philadelphia Electric
Company's Letter of Notification on
the Woodbourne-Heaton 230kV Line
to the OALJ for further hearing

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17120

Public Meeting held June 14, 1991

Commissioners Present:

William H. Smith, Chairman
Joseph Rhodes, Jr., Vice-Chairman
Wendell F. Holland, Commissioner
David W. Rolka, Commissioner

Letter of Notification of Philadelphia Electric Company relative to reconstructing and rebuilding of the existing 138 kV line to operate as a Woodbourne-Heaton 230 kV line in Montgomery and Bucks Counties.

No. A-110550,F.055

O R D E R

BY THE COMMISSION:

On September 14, 1990, Petitioners Robert Small, Frank English and Diane P.S. Koerper, et al., filed at the above docket an Emergency Petition of Non-Noticed Property Owners to Intervene for Reopening and to Suspend Approval (Emergency Petition) of a Commission order entered February 9, 1990. The February 9 order granted Philadelphia Electric Company (PECO) authority to reconstruct an abandoned Conrail 138 kV electric line as the Woodbourne-Heaton 230 kV line. Letter of Notification of Philadelphia Electric Company relative to reconstructing and rebuilding the existing line to operate as a Woodbourne-Heaton 230 kV line in Bucks and Montgomery Counties, A-110550,F.055. On March 8, 1991, the Commission issued an order denying the Emergency Petition.

On April 2, 1991, the Petitioners filed a Petition for Review with Commonwealth Court requesting that the Court 1) set aside the Commission order denying reopening and 2) remand the matter for hearing. On April 16, 1991, the Petitioners also filed with the Commonwealth Court a Petition for Stay Pending Review (Petition for Stay) in which the Petitioners requested the Court stay construction of the Woodbourne-Heaton line. On May 20, 1991, the Petitioners filed a Brief in Support of their Petition for Stay wherein they suggested that any harm to PECO could be avoided by requiring that the Commission institute hearings on an emergency basis, but they did not request remand hearings as relief. On May 21, 1991, the Commission filed an Answer to the Petition for Stay arguing that the Petitioners had not satisfied any of the criteria for a stay under Pa. P.U.C. v. Process Gas Consumers Group, 502 Pa. 545, 467 A.2d 805 (1983). Oral argument on the Petition for Stay was held before Commonwealth Court

Judge Madaline Palladino on May 22, 1991. At oral argument, Petitioners changed their request for relief and asked that the Judge remand the appeal to the Commission for hearing.

On May 24, 1991, the Commonwealth Court Judge issued an order remanding the case to the Commission to hold a hearing on the question of whether the Petitioners will be adversely affected by the reconductoring of the former Conrail line. The order further directed that this hearing be held within 90 days from the date of the remand order. On May 29, 1991, Judge Palladino issued an order supplementing her order of May 24, 1991 to reflect that jurisdiction over this matter was relinquished by Commonwealth Court.

On June 3, 1991, the Petitioners filed with the Commission a Petition for Hearing. In this petition, the Petitioners asked that a hearing be scheduled immediately; disclosed that they have already served discovery requests on PECO; and requested three days of hearings.

In compliance with the Judge's order issued May 24, 1991, the Commission directs that the record at Docket No. A-110550, F.055 be reopened so that the Petitioners can at a hearing introduce testimony and documentary evidence on the sole issue of whether the Petitioners will be adversely affected by the reconductoring of this former Conrail line as PECO's Woodbourne-Heaton 230 kV line. Accordingly, the Commission assigns this matter to Office of Administrative Law Judge and further directs that a hearing be scheduled no later than August 22, 1991 for the determination of the afore-mentioned issue.

We wish to emphasize that the scope of discovery and hearing on remand is to be limited to the issue as defined in Judge Palladino's order and herein. We also note that the number of days of hearing as well as the disposition of all discovery requests is left to the sound discretion of the Administrative Law Judge assigned to this proceeding; THEREFORE,

IT IS ORDERED:

1. That pursuant to Judge Palladino's May 24, 1991 order as supplemented by order dated May 29, 1991 the record at Docket No. A-110550, F.055, be hereby reopened for hearing and determination of the sole issue of whether the Petitioners will be adversely affected by the reconductoring of this former Conrail transmission line;
2. That consistent with the relief granted in Paragraph No. 1 above, the Petition for Hearing filed June 3, 1991 is granted to the extent consistent with this order;
3. That the Office of Administrative Law Judge expeditiously schedule a hearing for not later than August 22, 1991 for the sole purpose of determining whether the Petitioners will be adversely affected by the reconductoring of the former Conrail transmission line by Philadelphia Electric Company;

4. That a copy of this order is served on all parties of record to the instant Commission transmission line siting proceeding as well as to all parties having participated before the Commonwealth Court in the appeal of our earlier order at this docket.

BY THE COMMISSION,

A handwritten signature in black ink, appearing to read "Jerry Rich". The signature is stylized with a large, sweeping initial "J" and "R".

Jerry Rich
Secretary

(SEAL)

ORDER ADOPTED: June 14, 1991

ORDER ENTERED: June 14, 1991

CERTIFICATE OF SERVICE

I hereby certify that three copies of the document, Reply Brief on Remand of the Commission Law Bureau Prosecutory Staff, has been on this date served on the following persons in the manner indicated below:

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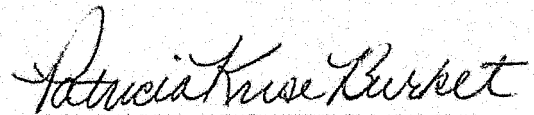
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June 23, 1993

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VIA FEDERAL EXPRESS

John G. Alford, Secretary
Pennsylvania Public Utility Commission
Room B-20, North Office Building
Harrisburg, PA 17105-3265

RECEIVED

JUN 23 1993

SECTION: *JOE*
Public Utility Commission

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconstructing and Rebuilding of the
Existing 138 kV Line to Operate as a Woodbourne-Heaton
230 kV Line in Montgomery and Bucks Counties -
Docket No. A-110550, F.055

Dear Secretary Alford:

Enclosed for filing with the Commission are the original and nine copies of Philadelphia Electric Company's Reply Brief on Remand in this proceeding. Please mark the Reply Brief on Remand filed as of June 23, 1993, the date indicated on the Federal Express delivery receipt. Also enclosed is an additional copy of this cover letter which I request that you date-stamp and return to me in the envelope provided. As indicated in Certificate of Service, I have served copies of this filing upon Administrative Law Judge Smolen and all parties of record.

Sincerely yours,

DOCUMENT
FOLDER

Ward L. Smith
Paul R. Bonney
Ward L. Smith

PRB/meb

Enclosure

cc: Honorable Herbert Smolen
Parties of Record

WVL

ORIGINAL

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of	:	
Philadelphia Electric Company	:	
Relative to Reconstructing and	:	
Rebuilding of the Existing 138 kV	:	Docket No.
Line to Operate as a Woodbourne-	:	A-110550, F.055
Heaton 230 kV Line in Montgomery	:	
and Bucks Counties	:	

REPLY BRIEF ON REMAND OF
PHILADELPHIA ELECTRIC COMPANY

BEFORE ADMINISTRATIVE LAW JUDGE HERBERT SMOLEN

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June 23, 1993

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INTRODUCTION

This Reply Brief responds to the Main Briefs on Remand of Protestants, the Office of Consumer Advocate ("OCA"), the Commission's Law Bureau Prosecutory Staff ("Law Bureau"), and Pennsylvania Power & Light Company ("PP&L").

The Commission remanded this proceeding for two limited purposes: (1) to take evidence on recent EMF scientific developments; and (2) to determine, in light of the EMF science, whether right-of-way width standards should exist for the Woodbourne-Heaton line and, if so, what they should be. March 26, 1993 Order, pp. 22-23.

The parties' Main Briefs make it clear that there is substantial agreement as to how Administrative Law Judge Smolen (the "ALJ") and the Commission should address these two issues on remand. The parties' positions on the two issues on remand are briefly addressed below in Part I of the Argument.

In addition, the Main Briefs discuss a number of proposals that go beyond the "science" and "standards" issues of this remand. These proposals are discussed below in Part II of the Argument.

ARGUMENT

I. There Is Substantial Agreement Among The Parties On The Two Remanded Issues

As noted, the Commission's March 26, 1993 Order (pp. 21-23) made clear that this is a limited remand with only two issues, the "science issue" and the "standards issue."

With regard to the recent scientific developments, all the parties except the Protestants agreed that the Commission should retain its conclusion, as set forth in its March 26, 1993 Order (p. 16), that the science is "inconclusive":

Law Bureau -- "A review of the record reveals that the evidence, although getting stronger on the side of there being no adverse human health effects from EMF, still remains inconclusive." Law Bureau Brief, p. 46.

OCA -- "Taking the evidence on remand as a whole, it can fairly be said that despite differences in the expert witnesses' opinions concerning how the available literature in all genres material to this question should be interpreted, we are still uncertain whether EMF causes harmful effects." OCA Brief, p. 14.¹

PP&L -- "As demonstrated by the record in this remand proceeding, and as confirmed by the reviews of groups of independent scientists who have reviewed the recent research in this area, the recent studies of possible adverse health effects from magnetic fields do not form a basis for concluding that magnetic fields (or EMFs) cause or

¹ PECO disagrees with several characterizations made in the OCA's Main Brief. For example, the OCA asserted (p. 14) that the presence of statistically significant results in the Swedish study means that Dr. Cole "overstated the case" with regard to that study. In fact, Dr. Cole testified at length that statistical significance is of minimal importance in evaluating this study; the important point is that the data from the study do not support a causal interpretation. See discussion of Dr. Cole's testimony in PECO's Initial Brief, pp. 9-14, 20-22. Given the general agreement among the parties on the two issues on remand, however, PECO will not enumerate its other points of disagreement.

contribute to adverse health effects in humans." PP&L Brief, p. 6.

PECO additionally requested that the Commission supplement its "inconclusive" finding to include additional information that would be helpful to the public:

PECO -- ". . . an enormous amount is known about whether EMF causes adverse human health effects. N.T. 1670. PECO therefore requests that the Commission alter its characterization of the science to make it clear to the public that, while it is fair to say that the science on EMF is "inconclusive," it is also fair to say that "after extensive scientific investigation, it has not been demonstrated that EMF causes adverse human health effects." PECO Brief, pp. 23-24.

Protestants, on the other hand, claim that EMF has been shown to cause cancer in children:

Protestants -- "While applicants' witnesses continue to interpret and reinterpret data so as to disagree with the authors of the studies showing adverse effects on children through causing cancer, they are unable to conclude that there are no adverse health effects from electromagnetic fields. (Tr. 1659-62)." Protestants' Brief, p. 3.

Protestants mischaracterize the state of the science. The record simply does not show that EMF causes cancer or other adverse health effects in children; to the contrary, all the witnesses agreed that the existing research does not demonstrate that EMF causes cancer or other adverse health effects in children. PECO Initial Brief, pp. 20-24. Moreover, contrary to Protestants' characterization, each of PECO's science witnesses did in fact conclude that there is evidence that EMF does not cause adverse human health effects. Id.

The resolution of the second issue on remand, the "standards issue," is, if anything, even more clear than the answer to the

science question. There should be no standards for this line. In their Main Briefs, not a single party recommended that the Commission establish standards for this line. Protestants did not even mention the concept of setting standards for this line. The OCA, Law Bureau, PP&L, and PECO all unequivocally recommended that the Commission should not set standards for the Woodbourne-Heaton line. OCA Brief, pp. 6, 8, 10; Law Bureau Brief, pp. 47-51; PP&L Brief, pp. 11-14, PECO Brief, pp. 24-26.²

Thus, there is substantial agreement among the parties as to the answer to the science question and no dispute among the parties as to the answer the standards question. The Commission should not -- indeed, based on the record evidence cannot -- set EMF right-of-way standards for this line.

II. The Parties' Other Proposals Are Outside The Scope Of This Remand

In the ordering paragraphs of its March 26, 1993 Order (p. 23), the Commission, after stating the two limited purposes for which it was remanding this proceeding, ordered "That no other

² As noted, the OCA recommended against setting any standard for this line. In its Conclusion (p. 19), however, the OCA recommended that if the Commission for some reason nevertheless decides to set a numeric EMF standard for this line, it should "order that a record be developed concerning the levels of EMF generated by newer lines, for which minimization of the electric and magnetic fields have been included in the design." It is unclear whether the OCA proposes that this record should be developed in further hearings in this proceeding or in a separate docket. Compare OCA Brief, p. 10 with OCA Brief, p. 19. Whichever, it should be recalled that the Commission's March 26, 1993 Order clearly stated that one purpose of the just-concluded hearings was to develop such a record, if any party deemed it necessary. It would be inappropriate to hold yet another round of hearings to do precisely what the Commission provided an opportunity to do in this remanded hearing.

matters are to be considered. . . ." Each of the parties other than PECO nonetheless made proposals for additional Commission action on EMF. Those proposals are addressed below.

A. The Proposals Of PP&L, The OCA, And Law Bureau Are Outside The Scope Of This Limited Remand And Should Not Be Decided From This Record

In their respective briefs, PP&L, the OCA, and Law Bureau each made proposals for further Commission action. Specifically, PP&L recommended (p. 16) that the Commission institute a separate proceeding to adopt a mandatory, statewide EMF policy largely based on the concept of "prudent avoidance." The OCA also suggested (p. 17) that the Commission adopt the concept of prudent avoidance as a statewide policy and reiterated its argument that the Commission should revise the notice provisions of its Letter of Notification regulations. For its part, the Law Bureau also recommended (p. 49) that the Commission adopt prudent avoidance as a statewide policy (to be applied on a case-by-case basis), and in addition recommended (pp. 46, 50-51) that the Commission continue to monitor the EMF research and establish a "data registry" of magnetic field levels associated with transmission lines in Pennsylvania.

PECO already practices many of the "prudent avoidance" measures suggested by these parties. PECO Rebuttal on Remand No. 2 [Boeggeman], p. 1. In fact, the record is clear that the Woodbourne-Heaton line is consistent with the policy of prudent avoidance. I.D., pp. 127-28; PECO Direct on Remand No. 2 [Boeggeman], pp. 3-4. Nonetheless, PECO believes that the

Commission should not adopt the proposals of PP&L, the OCA, and Law Bureau in these remanded proceedings.

First, the Commission's March 26, 1993 Order made it clear that this remand was limited to issues specific to this line. As a result, while there is an extensive record showing that this line is consistent with the concept of prudent avoidance (as well as numerous general statements by the witnesses and parties as to what they believe to be the proper elements and interpretation of prudent avoidance), this record simply does not contain a rigorous exploration of whether Pennsylvania should have a statewide EMF policy and, if so, what it should be.

Second, the Commission can decide this case without deciding the statewide questions. The record shows that the kinds of prudent avoidance evaluations that PP&L, the OCA, and Law Bureau believe should be conducted on a statewide basis have been conducted for the Woodbourne-Heaton line.³

Third, this is not the proper forum for making such decisions because the other Pennsylvania utilities were not allowed to participate in this proceeding. March 26, 1993 Order, p. 22. If the Commission decides to institute a separately docketed proceeding to squarely address possible statewide EMF policies, PECO will actively participate in that proceeding --

³ In fact, both PP&L (pp. 15-22) and Law Bureau (pp. 51-52) specifically recommended that the Commission should not allow development of a statewide policy to interfere with immediate energization of the Woodbourne-Heaton line.

as, undoubtedly, will the other electric utilities in Pennsylvania that would be affected by such a policy.

The Commission may wish to initiate some other docket to examine some or all of the ideas for statewide policy proposed by the parties to this proceeding. But energization of the Woodbourne-Heaton line should not be delayed pending such a proceeding.

B. The Protestants' Proposals Are Outside The Scope Of This Limited Remand And Beyond The Commission's Jurisdiction

In their May 14, 1993 position statement, Protestants set forth two proposals based on their view that EMF has been shown to cause childhood cancer: (1) that PECO should purchase "all properties any portion of which would be within levels above one milligauss more than 5% of the time," and (2) that the existing overhead Woodbourne-Heaton line should be replaced with an underground line. PECO submitted rebuttal testimony on these proposals and addressed them in its Initial Brief. Those arguments will not be revisited here.

Unfortunately, it has now become unclear precisely what Protestants are requesting from the Commission in this remand. In their Main Brief, Protestants did not advocate the two proposals from their formal position statement, but instead made two new proposals. Neither of these new proposals is within the limited scope of this remand. Moreover, the relief requested in both of

Protestants' new proposals is beyond the Commission's jurisdiction and authority.⁴

⁴ Aside from their two new arguments, which are discussed below in text, Protestants did briefly mention "undergrounding," Protestants' Brief, p. 2, but did not propose it in their ordering paragraphs. In addition, Protestants reiterated their request that they be permitted to re-examine the Commission's "need" finding in a full evidentiary hearing. *Id.*, p. 4. Protestants have presented this "need" argument to the Commission on multiple previous occasions and have failed in each case to convince the Commission that a further examination of need is warranted. *E.g.*, Commission's March 6, 1991 Order, Commission's June 14, 1991 Order, p. 2, ALJ Smolen's July 18, 1991 Order, p. 5. Protestants do not claim that any new developments in this remanded proceeding justify any change in those previous decisions.

The OCA also reiterated its request for a further examination of need. OCA Brief, pp. 1, 16. The OCA, however, based its request on a new -- and incorrect -- argument which must be dispelled. The OCA claims that a full evidentiary hearing on need "would be required in order for a meaningful application of 'prudent avoidance' principles to this line." (citing Mr. Janes' cross-examination at N.T. 1617-18.) First, it should be realized that Mr. Janes did not testify that a full evidentiary hearing on need is required to have a meaningful application of prudent avoidance. He testified that (1) if there were no need for a line, it would not be built, and (2) he would not make judgment for selecting a numeric EMF level for this line without understanding the benefits. N.T. 1617-18.

More importantly, this record is replete with testimony, including that of OCA's witnesses Dr. Rosenbaum and Mr. Janes, in which the concept of prudent avoidance was applied without a full evidentiary hearing on need. Those witnesses uniformly stated that the concept of prudent avoidance simply means adopting field exposures at small or modest costs -- and none mentioned "need" as part of this evaluation. *E.g.*, OCA Statement No. 2 [Rosenbaum], pp. 6-9; OCA Statement No. 1B [Janes], p. 6. The ALJ even made findings of fact on prudent avoidance. I.D., pp. 127-29. The OCA cannot now credibly argue that a single, ambiguous comment on cross-examination somehow proves that a "full evidentiary hearing" on need is required in order to make a "meaningful application" of prudent avoidance -- especially since the OCA and its witnesses have never before mentioned this supposed connection between need and prudent avoidance in three sets of written testimony, cross-examination, briefs, and exceptions in which the concept of prudent avoidance as it applies to this line was fully explored.

The Protestants' first new proposal is a variation on their "purchase property" proposal. Protestants now appear to be arguing that PECO should act as a "property broker," buying properties near the line then reselling those properties to others. Protestants' Brief, pp. 2-3. This proposal should be rejected for several reasons.

First, it should be summarily rejected because it is a new proposal forwarded for the first time during the briefing period. Protestants had the opportunity to present proposals in their formal position statement -- in fact, they were required to do so by the ALJ's May 6, 1992 Order. As PECO stated in its May 3 letter requesting formal position statements (p. 2):

"... a party should not be made to guess during the hearing process what position another party ultimately might take in brief. To do so would deny a party the right to respond with testimony and other evidence to the position advanced by that other party and would thereby raise serious procedural due process concerns. In fact, the Commission has in prior cases disregarded positions raised for the first time in brief and not addressed in the record."
(citations omitted.)

Protestants chose not to present their "property broker" proposal in their formal position statement, and it is too late to do so now.

Second, the unrebutted record evidence shows that any proposal -- such as this proposal -- which has as its purpose "moving in order to get away from" transmission lines is not consistent with the concept of prudent avoidance. PECO Rebuttal on Remand No. 2 [Boeggeman], p. 4.

Third, as PECO noted in its Initial Brief (p. 27, n. 2), "since the Protestants' stated justification for this proposal [to have PECO buy property] is their view that EMF has been demonstrated to cause adverse human health effects, it is inappropriate to assume that properties, once purchased under that view, could or should be sold to others."

Finally, this proposal is actually a fairly bald request that the Commission award condemnation damages to the Protestants via the mechanism of having PECO purchase their properties. The Commission has already ruled that awarding condemnation damages is beyond its authority. Commission's March 8, 1991 Order, p. 10, n. 9 and p. 13, n. 11.

Protestants' second new proposal is a request that PECO pay them \$100,000 for legal fees and to compensate them for "the adverse property damages to be visited upon them." Protestants Brief, p. 4. Besides being factually unsupported, Protestants' proposal is legally without basis.

Insofar as Protestants are asking for legal fees, their request should be rejected because the Commission has determined in previous cases that it has no authority to award attorney's fees and costs. Pa. P.U.C. v. Duquesne Light Co., 61 Pa. P.U.C. 485 (1986) (under the "American rule," the Commission cannot award attorney's fees absent specific statutory authority for such an award); Pa. P.U.C. v. National Fuel Gas Distribution Corp., 63 Pa. P.U.C. 68, 71 (1987) ("[T]his Commission has not been granted any explicit statutory authority that would permit

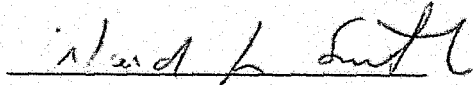
awards of attorneys' fees and costs. It is, furthermore, clear that implied Commission jurisdiction does not include equitable powers. We do not have the authority to grant this Petition" for attorneys' fees.)

Insofar as Protestants are asking for property damages, their request should be rejected because it is, quite simply, a request for an award of condemnation damages.

CONCLUSION

For the reasons stated above, the Commission should resolve the two issues on remand as recommended by PECO in its Initial Brief and Reply Brief, set aside the proposals of PP&L, the OCA, and Law Bureau for statewide policy consideration because they are outside the scope of this remand, reject Protestants' new proposals because the relief requested in those proposals is outside the Commission's authority, and issue an Order reaffirming its February 9, 1990 approval to reconstruct and energize the Woodbourne-Heaton 230 kV line.

Respectfully submitted,



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June 23, 1993

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of Philadelphia Electric Company's Reply Brief on Remand upon the following parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54:

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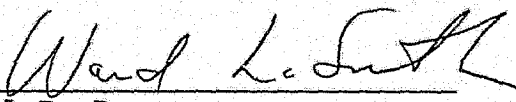
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Re: Letter of Notification of
Philadelphia Electric Company
Relative to Reconductoring and
Rebuilding of the Existing 138-KV
Line to Operate as the Woodbourne-
Heaton 230KV Line
Docket No. A-110550 F055

Dear Secretary Alford:

Enclosed please find for filing an original and nine
copies of the Reply Brief of the Office of Consumer Advocate on
Remand in the above-captioned proceeding.

Copies have been served upon all parties of record as
shown on the attached Certificate of Service.

Sincerely,

Dianne E. Dusman
Dianne E. Dusman
Assistant Consumer Advocate

DOCUMENT
FOLDER

Enclosures
cc: All parties of record

17120

CERTIFICATE OF SERVICE

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconductoring and Rebuilding of the Existing
138-KV Line to Operate as the Woodbourne-Heaton 230KV Line
Docket No. A-110550F055

I hereby certify that I have this day served a true copy
of the foregoing document, Reply Brief of the Office of Consumer
Advocate on Remand, upon parties of record in this proceeding in
accordance with the requirements of 52 Pa. Code § 1.54 (relating to
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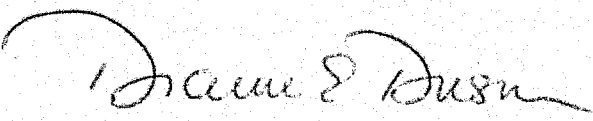
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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF :
PHILADELPHIA ELECTRIC COMPANY :
RELATIVE TO RECONDUCTORING : Docket No. A-110550 F055
AND REBUILDING OF THE EXISTING :
138-KV LINE TO OPERATE AS THE :
WOODBOURNE-HEATON 230KV LINE :

OFFICE OF CONSUMER ADVOCATE
REPLY BRIEF ON REMAND

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DATED: June 23, 1993

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I. INTRODUCTION

The Office of Consumer Advocate (OCA), along with PECO, the Prosecutory Staff of the Law Bureau (Law Bureau), and Pennsylvania Power and Light Company (PP&L) filed Briefs on June 16, 1993, in accordance with the scheduling order of the Administrative Law Judge (ALJ). The Protestants filed Proposed Findings of Fact and Conclusions of Law. The OCA submits this Reply Brief on Remand in accordance with the ALJ's order as well.

The OCA's position on remand was set forth fully in its June 16, 1993, Main Brief; therefore, not all issues related to the remand will be discussed herein. Some of the statements and arguments made by the other parties require additional discussion and clarification.

It should be noted at the outset that the differences in opinion between the Company witnesses and the OCA witnesses concerning the scientific evidence relevant to the EMF issue and the appropriate regulatory response thereto have continued on remand, substantially unchanged. Most of the Company witnesses continue to assert that there is no scientific evidence upon which to conclude that EMF causes adverse health effects. Although PECO witness Cole has asserted on remand that additional epidemiological evidence supports the "negative" hypothesis, i.e. that EMFs do not cause adverse health effects, he asserts as well that some of the new evidence supports a negative conclusion as easily as a positive one. PECO Direct on Remand No. 4 at 5. Consistent with the initial testimony offered by OCA witnesses Rosenbaum and Janes, OCA

witness Janes continues to assert that although the science is inconclusive on this point, sufficient indications appear which justify concerns about the impacts upon health and thus cannot be ignored by regulators.

The OCA submits that none of the PECO witnesses have fully addressed the public policy implications of the uncertain and inconclusive state of scientific information as to this issue. In fact, the Company appears to continue to attempt to persuade this Commission that post hoc applications of prudent avoidance principles--without more--are adequate to meet the public's legitimate health concerns in this matter.

As the OCA has pointed out before, however, prudent avoidance principles require evaluation in advance of the need for additional transmission for the application of those principles to be meaningful. OCA M.B. at 44 (citing OCA St. 2 at 7-8) The Commission's Order approving the Letter Notification and finding the line to be needed does not address whether these actions are consistent or not with those principles. Commission Opinion and Order of February 9, 1990. As the Protestants point out in their Proposed Findings, no evidentiary record has been created on the threshold issue. Protestants' Proposed Findings at 1-2. From the commencement of this case, the OCA has expressed those same concerns with regard to the Protestants' due process rights. See OCA Statement in Support of Emergency Petition, January 3, 1991; OCA M.B., 14-18.

II. REPLY TO PECO

Initially, the OCA would like to comment upon the Company's "Statement of Questions Involved." The Company asserts that the first "question involved" is whether "recent EMF studies justify any change in the Commission's finding that the science is 'inconclusive'." The OCA submits that the import of the Commission's remand order was to determine whether newly available scientific evidence justified the setting of right of way standards. To an extent, therefore, the question whether the science is still inconclusive is an implicit threshold question which the OCA can generally agree should be asked.

As stated in the OCA Brief on Remand (OCA B.R.), however, an assertion that recent scientific developments have provided additional evidence that EMFs do not cause adverse human health effects is an overstatement of the case. OCA B.R. at 14. A more balanced assessment of the available scientific evidence justifies no change in the Commission's findings that the science is "inconclusive." To the extent, therefore, that this question is adopted by the Commission in its Order as an appropriate one, the answer justified by the record evidence taken as a whole is "no." Recent EMF studies do not justify a change in the Commission's finding that the science is "inconclusive." See OCA B.R. at 10-14. PECO admits, at least, that "it is not false to say that the

science on EMF is unclear, uncertain or inconclusive." PECO B.R. at 23-24.¹

The OCA would also wish to correct a misimpression conveyed by PECO in its Initial Brief on Remand (PECO B.R.). Initially, it should be noted that Mr. Janes' degree and post-graduate education are in physics, biophysics, and radiological physics²; however, his experience as a public policy expert in the areas of electromagnetic radiation and other forms of radiation spans more than thirty years. OCA St. 1, Exh. DEJ-1. Mr. Janes is the only witness in this proceeding who has both reviewed the scientific literature in all genres as a basis for expressing his opinion as to the state of science on this issue, and attempted to apply that conclusion in an attempt to guide the Commission in this proceeding.

The Company, however, portrays Mr. Janes' testimony as agreeing with the testimony of their witnesses that "there has not been a demonstrable health hazard." PECO B.R. at 6. The OCA would emphasize that this statement must be read together with Mr. Janes' testimony that "experimental evidence makes the hypothesis of

¹ Interestingly, PECO does not propose a finding that the more recent studies provide additional evidence that EMFs do not cause adverse human health effects; rather, only a finding that such effects "have not been demonstrated" is proposed. PECO Proposed Finding No. 11.

² PECO refers to the fact that Mr. Janes is a biophysicist, not an epidemiologist. PECO B.R. at 20.

harmful effects plausible, and the possibility of harm cannot be summarily dismissed." OCA St. 1B at 5. As such, Mr. Janes' testimony is not in total agreement with that of the Company witnesses, who do not admit to this possibility and who do not address what its impact should be upon regulatory action.

In addition, the Company makes much of Mr. Janes' use of the word "troublesome" when referring to the results of the Swedish study. PECO B.R. at 6, 20. First of all, Mr. Janes used the word "troublesome" when referring to a particular finding reported by the Swedish researchers, i.e., the positive association between childhood leukemia and magnetic field exposure. OCA St. 1B at 4. Mr. Janes clarified on cross-examination that his intention was to indicate that the finding was the most "troublesome" of all the Swedish researchers' findings, because of the fact that the researchers' observation of an association between childhood leukemia and exposure to magnetic fields is the "most consistent" one "across the studies" reviewed. Tr. 1612. Mr. Janes reiterated upon further cross-examination that what he meant by "troublesome" as to that particular observation was that it was consistent, and based upon that consistency, the connection "needs further investigation" and "needs to be looked at [in] some more detail." Tr. 1612-1613. Despite his repeated clarification, the Company attempts to paint Mr. Janes' testimony in a way which implies that he was addressing the validity of the Swedish study, rather than the particular association between childhood leukemia and EMF exposure, and which omits to state that it was the consistency of

that finding across the epidemiologic studies that rendered it worthy of further investigation. PECO B.R. at 6.

In addition, the OCA would point out that although Drs. Gelmann and Bockman again conclude that research evidence provides no basis to conclude that EMF exposure causes adverse health effects, these opinions are drawn only from review of the literature in those witnesses' fields of specialty, i.e. endocrinology and immunology, and oncology, respectively. The witnesses have not claimed to review the science overall, nor the epidemiological studies recently made available, in order to form these conclusions.

As for Dr. Cole, the effort to minimize the importance of the Swedish study by both the witness and PECO is clear. It is primarily in the area of epidemiology, which provides the most consistent basis for observing a connection between childhood leukemia and EMF exposure, that both Dr. Cole and the Company overstate the case. PECO B.R. at 9-14. His conclusion that the data in the Swedish study regarding childhood leukemia "support a null or negative interpretation as easily as a positive interpretation" (PECO Direct on Remand No. 4 at 5) actually supports the premise that the scientific evidence is still unclear. Therefore, his testimony that he is "excluding the causal argument, which is in effect the whole argument" (Tr. 1661) is unsupported by the evidence.

The Commission should therefore reject any argument or proposed findings that the more recent studies show that EMFs do

not cause adverse health effects. The most that can be inferred from the more recent studies is that the scientific evidence is still unclear. The fact that the science is inconclusive, however, does not justify that the issue be ignored by either the utility or the regulatory agency. Principles of a prudent policy, as set forth in the OCA's original testimony, should be applied as a way of dealing with scientific uncertainty in a reasonable manner.

III. REPLY TO PP&L AND LAW BUREAU

At page 15 of its Brief on Remand, PP&L urges the Commission, based on the record in this case, to take immediate concrete steps to begin to address the concerns of the public regarding the EMF issues. PP&L continues by outlining a comprehensive EMF policy that contains many of the elements of the prudent policy discussed by the OCA witnesses in this case. PP&L B.R. at 16-21. In the same vein, the Prosecutory Staff of the Law Bureau makes some suggestions for Commission action such as establishing a committee or contracting with an outside source to monitor on-going research. Prosecutory Staff B.R. at 46. In addition, the Prosecutory Staff suggests that the Commission require electric utilities include information in transmission line filings regarding expected EMF levels from the line, and that the Commission establish a data registry of these expected fields from future lines. The OCA generally supports these recommendations of PP&L and the Prosecutory Staff.

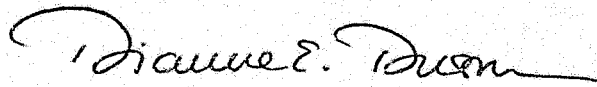
As the OCA set forth in its Main Brief, this case has demonstrated substantial problems with the Commission's current transmission siting regulations. OCA M.B. at 55-57. Moreover, as set forth fully in the OCA's Main Brief, this case has demonstrated the need for regulatory guidance, as the public concern over this uncertain risk continues to grow. OCA M.B. at 43-48. In light of this, the OCA continues to urge the Commission to amend its regulations, publish them in the Pennsylvania Bulletin and receive public comment on the regulations. OCA M.B. at 57. Additionally,

the OCA would support a Commission effort to establish guidelines and approaches that considered such suggestions and policies as those forwarded by PP&L, the Prosecutory Staff and the OCA. The OCA submits that such guidance is important given the continued uncertainty over the potential health effects of electromagnetic fields.

IV. CONCLUSION

For all of the reasons set forth in the OCA's Brief on Remand and above, the OCA submits that the Commission should make findings and conclusions consistent with those proposed by the OCA.

Respectfully submitted,



Tanya J. McCloskey
Dianne E. Dusman
Assistant Consumer Advocates

Counsel for:
Irwin A. Popowsky
Consumer Advocate

Office of Attorney General
Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, PA 17120
(717) 783-5048

DATED: June 23, 1993
8975

MARTE AND TOADVINE

ATTORNEYS AT LAW
344 SOUTH BELLEVUE AVENUE
LANGHORNE, PENNSYLVANIA 19047

CHARLES O. MARTE, JR.
ALLEN W. TOADVINE

June 21, 1993

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JUN 29 1993
SECRETARY'S
PUBLIC UTILITY COMMISSION

757-0344
AREA CODE 215
FAX: (215) 757-3048

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JUN 28 1993
Office of A. L. J.
Public Utility Commission

Honorable Herbert S. Smolen
Administrative Law Judge
Pennsylvania Public Utility Commission
1302 Philadelphia State Office Building
Broad and Spring Garden Streets
Philadelphia, PA 19130

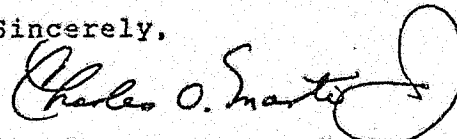
Re: Letter of Notification of Philadelphia Electric
Company Relative to Reconstructing and Rebuilding
of the Existing 138 KV Line to Operate as the
Woodbourne-Heaton 230 KV Line in Montgomery
and Bucks Counties

A-110550 F0055

Dear Judge Smolen:

This letter is to advise you that I no longer represent
Lower Southampton Township in the above captioned matter. The
new solicitor for Lower Southampton Township is Robert R. Fleck,
Esquire, 198 North Pine Street, Langhorne, Pennsylvania 19047.
Please forward all future correspondence to Mr. Fleck. Thank you
in advance for your cooperation in this matter.

Sincerely,



Charles O. Marte, Jr.

COM/emt

- cc: Charles F. Hoffman, Esquire
- Robert J. Sugarman, Esquire
- Paul R. Bonney, Esquire
- Patricia Krise Burket, Esquire
- Arundhati Khanwalkar, Esquire
- Robert R. Fleck, Esquire
- Kathleen R. Goldhahn

DUCKETED
JUL 22 1993

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JUN 23 1993

PUBLIC UTILITY COMMISSION
PHILADELPHIA OFFICE
ADMINISTRATIVE LAW JUDGE

ORIGINAL

ROBERT R. FLECK

ATTORNEY AT LAW

198 NORTH PINE STREET
LANGHORNE, PA 19047

OFFICE 215-750-7210
FACSIMILE 215-750-9062

NEW JERSEY OFFICE
22 EAST VIRGINIA AVENUE
HAVEN BEACH, NEW JERSEY 08008

609-492-2421

July 1, 1993

A110550 F.055

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JUL 6 1993

SECRETARY'S OFFICE
Public Utility Commission

John G. Alford, Secretary
Commonwealth of Pennsylvania
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

RE: PECO Reconstructing and Rebuilding of the Existing
138 kV Line to Operate as the Woodbourne-Heaton 230
kv Line in Montgomery and Bucks County

A110550 F.055

Dear Mr. Alford:

Please be advised that I have been appointed the
Solicitor for Lower Southampton Township, Bucks County, Pennsyl-
vania. Kindly enter my appearance in the above-referenced
matter.

Very truly yours,



ROBERT R. FLECK

RRF:aew

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JUL 26 1993

NVL

ORIGINAL

LDA

**PHILADELPHIA ELECTRIC COMPANY
LEGAL DEPARTMENT**

James W. Durham
Senior Vice President
and General Counsel

2301 Market Street, Box 8699
Philadelphia, PA 19101
(215) 841-5544 FAX: 568-3389

Bjarnie R. Anderson
Legal Administrator

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Gregory Golazaski
John C. Halderman
Elizabeth P. Harris
Mary McFall Hopper
Assistant General Counsel

Stephen L. Huntoon
Thomas G. Jackson
J. Lindsay Johnston
Conrad O. Kattner
Kimberly Lewis
Stephanie Whitton Lewis
Jeffrey J. Norton
Christine A. Reuther
Wendy Schermer
Jenny P. Shulbank
Ward L. Smith
Noel H. Trask
Assistant General Counsel

July 7, 1993

VIA TELEFAX AND FIRST CLASS MAIL

John G. Alford, Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconstructing and Rebuilding of
Existing 138 kV Line to Operate as a Woodbourne-Heaton
230 kV Line in Montgomery and Bucks Counties
Docket No. A-110550, F.055

RECEIVED
JUL 12 1993
SECRETARY'S OFFICE
Public Utility Commission

Dear Secretary Alford:

Pursuant to our letter to you of July 2, 1992, this letter is to inform the Commission, Administrative Law Judge Smolen and the parties that, due to increased load associated with the current hot weather conditions, Philadelphia Electric Company ("PECO") may need to energize the Woodbourne-Heaton 230 kV transmission line on an emergency basis to avoid excessive voltage drops to its customers.


If it does become necessary to energize the Woodbourne-Heaton 230 kV line, we will of course promptly inform the Commission, Administrative Law Judge Smolen and the parties that such action has been taken.

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JUL 30 1993
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John G. Alford, Secretary
July 7, 1993
Page 2

Please call me if the Commission has any questions regarding the above.

Sincerely yours,



Ward L. Smith

xc (via Telefax):

David W. Rolka, Chairman
Joseph Rhodes, Jr., Vice Chairman
John Hanger, Commissioner
John Quain, Commissioner
Lisa Crutchfield, Commissioner
Honorable Herbert Smolen
Parties of Record

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JUL 12 1993
SECRETARY'S OFFICE
Public Utility Commission

PHILADELPHIA ELECTRIC COMPANY
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Wendy Schermer
Jenny P. Shulbank
Ward L. Smith
N. H. Trask
Assistant General Counsel

July 8, 1993

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JUL 12 1993

SECRETARY'S OFFICE
Public Utility Commission

Assistant General Counsel

VIA TELEFAX AND FIRST CLASS MAIL

John G. Alford, Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconstructing and Rebuilding of the
Existing 138 kV Line to Operate as a Woodbourne-Heaton
230 kV Line in Montgomery and Bucks Counties
Docket No. A-110550, F.055

Dear Secretary Alford:

This is to inform the Commission, Administrative Law Judge Smolen and the parties that, due to excessive voltage drops caused by the increased load associated with the current hot weather conditions, the Woodbourne-Heaton 230 kV transmission line was energized on an emergency basis at approximately 2:45 p.m. today, Thursday, July 8.

Please call if the Commission has any questions regarding this matter.

Sincerely yours,

Ward L. Smith

Ward L. Smith

AVL
DOCUMENT
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xc (via Telefax):

David W. Rolka, Chairman
Joseph Rhodes, Jr., Vice Chairman
John Hanger, Commissioner
Parties of Record

John Quain, Commissioner
Lisa Crutchfield, Commissioner
Honorable Herbert Smolen

DOCKETED
AUG 02 1993

ETL

PHILADELPHIA ELECTRIC COMPANY
LEGAL DEPARTMENT

ORIGINAL

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Senior Vice President
and General Counsel

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Aubra S. Gaston
Dawn R. Getty
Gregory Golazecki
John C. Halderman
Elizabeth P. Harris
Mary McFall Hopper
Assistant General Counsel

DOCKETED
AUG 17 1993

July 20, 1993

Stephen L. Huntoon
Thomas G. Jackson
J. Lindsay Johnston
Conrad O. Kattner
Kimberly Lewis
Stephanie Whitton Lewis
Jeffrey J. Norton
Christine A. Reuther
Wendy Schermer
Jenny P. Shulbank
Ward L. Smith
Noel H. Trask
Assistant General Counsel

TELECOPY AND FIRST-CLASS MAIL

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JUL 23 1993

John G. Alford, Secretary
Pennsylvania Public Utility Commission
Room B-20, North Office Building
Harrisburg, PA 17105-3265

PUBLIC UTILITIES OFFICE
Public Utility Commission

Re: Letter of Notification of Philadelphia Electric Company
Relative to Reconstructing and Rebuilding of the Existing
138 kV Line to Operate as a Woodbourne-Heaton 230 kV Line in
Montgomery and Bucks Counties - Docket No. A-110550,F.055

Dear Secretary Alford:

This letter is to further inform the Commission,
Administrative Law Judge Smolen and the parties about the recent
emergency use of PECO's Woodbourne-Heaton 230 kV transmission
line.

The Woodbourne-Heaton line was energized on an emergency
basis at approximately 2:45 p.m. on Thursday, July 8, 1993 and
remained energized until approximately 9:30 p.m. that evening.
As described in our letters to you of July 7, 1993 (informing the
Commission that PECO might need to energize the line), and July
8, 1993 (informing the Commission that PECO had energized the
line), the line was energized to avoid excessive voltage drops
caused by increased load associated with the recent hot weather
conditions.

The line was again energized at approximately 11:45 a.m. on
Friday, July 9, 1993 and remained energized until approximately
9:45 p.m. On this date, the line was energized in the morning
due to failure of a high-voltage capacitor bank at Emilie

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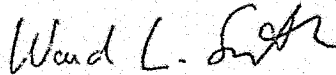
July 20, 1993
Page 2

Substation in lower Bucks County and remained energized in the afternoon to avoid excessive voltage drops.

The Woodbourne-Heaton line has once again been placed on emergency standby status. We will inform the Commission if it again becomes necessary to energize the Woodbourne-Heaton line pending resolution of the ongoing regulatory proceeding.

Please call if the Commission has any questions about this matter.

Sincerely yours,



Ward L. Smith

WLS/mtj

xc Honorable Herbert Smolen
Parties of Record