

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

RECEIVED  
AUG 9 1991  
SECRETARYS OFFICE  
Public Utility Commission

LETTER OF NOTIFICATION OF :  
PHILADELPHIA ELECTRIC COMPANY :  
RELATIVE TO RECONSTRUCTING AND :  
REBUILDING OF THE EXISTING : DOCKET NUMBER A-110550, F.055  
138 KV LINE TO OPERATE AS A :  
WOODBOURNE-HEATON 230 KV LINE :  
IN MONTGOMERY AND BUCKS COUNTIES :

ORDER

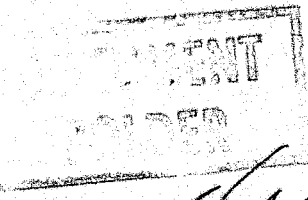
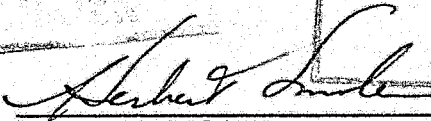
AND NOW, to wit, this 7th day of August, 1991, upon consideration of the Petition to Intervene in this proceeding filed by Pennsylvania Power and Light Company and the Answer of Petitioner/Intervenors; and for the reasons set forth in said Petition, which the Administrative Law Judge concludes to be reasonable and proper, it is hereby ORDERED:

1. That the Petition to Intervene in this proceeding filed by Pennsylvania Power and Light Company be and the same is hereby granted.

2. That Pennsylvania Power and Light Company be and it is subject to all prior rulings and orders issued, and procedural schedule established in this matter.

Date:

Aug. 7, 1991

  
  
HERBERT SMOLEN  
Administrative Law Judge

DOCKETED  
AUG 17 1991

ORIGINAL

SUGARMAN & ASSOCIATES

ATTORNEYS AT LAW

16TH FLOOR, CITY PLACE

101 NORTH BROAD STREET

PHILADELPHIA, PENNSYLVANIA 19107

215-751-9733

FAX 215-751-9891

ROBERT J. SUGARMAN

ALAN M. KAPLAN

MARCIA E. BERRY

DAVID A. ROBERTS

LEGAL ASSISTANT

August 7, 1991

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

RECEIVED

AUG 9 1991

110550 F55

SECRETARY'S OFFICE  
Public Utility Commission

Re: Application No. A-110550 F055

Dear Mr. Rich:

Please find enclosed for filing Protestants' Motion in the above matter.

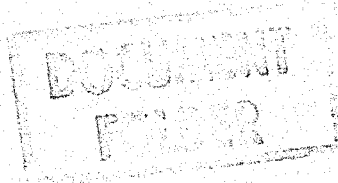
Thank you for your consideration.

Sincerely,

  
Robert J. Sugarman

RJS:er  
Enclosures

cc: Tanya J. McCloskey, Esquire  
David Rosenbaum, Esquire  
Patricia Krise Burket, Esquire  
Tinku Khanwalkar, Esquire  
Paul R. Bonney, Esquire



NVL

ORIGINAL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

RECEIVED

AUG 9 1991

FILED  
AUG 12 1991

PROTESTANTS'  
MOTION TO COMPEL RESPONSE OF  
PUC PROSECUTORIAL STAFF TO  
REQUEST FOR PRODUCTION OF DOCUMENTS

SECRETARY'S OFFICE  
Public Utility Commission

Pursuant to 52 Pa. Code §5.342(e), protestants Robert Smalls et al move to compel the PUC to provide full and complete responses to requests for production. As basis therefor, protestants aver the following:

1. This case now involves whether the Philadelphia Electric Company (hereinafter "PECO") 238 KV power line will adversely affect families who reside near the right of way.

2. On March 8, 1991, the Commission published an Order, pursuant to statements of Commissioners which characterized the literature of EMF and opined as to the available authoritative studies, some specifically, but others generically without identification.

3. For years, the Commission has been holding meetings by invitation and receiving literature on EMF.

4. On May 30, 1991, protestants filed document requests. On July 12, 1991, the Commission prosecutorial staff filed objections to Petitioners' Request for Production of Documents seeking documents on EMF compiled and/or relied upon by the Commission. A

DOCUMENT  
FOLDER

copy of the Request for Production of Documents is attached hereto as Exhibit "A".

5. By the Prosecutorial Staff the PUC claims that Requests for Production Nos. 1 and 5 are "overburdensome and overly broad". It also claims that Requests for Production of Documents Nos. 3 and 4 are outside the scope of discovery. None of these claims are true and the documents should be produced.

6. Request for Production of Documents No. 1 asks for all EMF studies available to the PUC. It is not overburdensome or overly broad. The Commission seems to have a general library from which Commission and staff members have found resources relied upon by the Commissioners and staff on March 8. The statements of Commissioners Smith and Holland of March 6, 1991 refer to EMF studies. (Exhibit B). Articles are also referred to in the Commission Order of March 8, 1991. (Exhibit C). Since such studies are available, there appears to be compilation of EMF studies that is utilized by the Commission as a whole. Protestants do seek a list of every study ever published and available at the Library of Congress.

Commissioner Holland, in particular, mentioned a joint independent research effort proposed and adopted by the NARUC. Any documents relating to this effort should be provided.

Furthermore, Request for Production of Documents No. 1 was meant to ease the burden on the Commission staff, rather than creating more of a burden. This question was designed, hopefully, to avoid the necessity of having to subpoena Commissioners and

staff members, who already referred to this material in the March 8 decision and related statements.

Thus, Request for Production of Documents No. 1 is not overburdensome or overbroad and it would be a denial of due process for the Public Utility Commission to deny information that they have utilized. The documents asked for are relevant under 52 Pa. Code §5.321(b) because they are likely to lead to such discoverable material as what knowledge the Commissioners relied in their decision making.

7. Requests for Production of Documents No. 3 and No. 4 sought transcripts or compilation of data presented at Commission sponsored seminars on EMF from 1985 to 1991 and whatever documents were distributed at those seminars. These documents are relevant to the case for the same reasons as the documents asked for in Question No. 1. The information was apparently relied on by the Commission. Protestants are not asking to discover mental impressions, conclusions or opinions of the prosecutory staff. The documents in question have nothing to do with the Prosecuting Staff. Protestants are simply seeking to discover the information in the possession of the Commission.

Answering these questions would not be providing PAUSE or their counsel with technical research services. PAUSE is entitled to know what information the Commission has. The questions are not asked for research purposes at all - they are for the purpose of hearing preparation, to know what the staff might utilize.

Finally, Protestants could not have been invited to these

seminars (except the last) because they only organized within the last year. They were unable to attend that last one.

8. Once again, in response to Request for Production No. 5 (which asks for all economic studies available to the PUC), relating to "the costs of adjusting electrical facilities standards to deal with EMF and/or the potential liabilities of not avoiding EMF exposure), if the Commission has a general library or list of studies which they use and from which the documents needed to respond to this question can be obtained, it should be provided. And once again, protestants seek to avoid having to subpoena Commissions or Commission staff as to what economic studies they personally had in their possession when they formulated the March 8, 1991 decision.

This request is also neither vague nor unintelligible. It is clear that protestants are simply asking for studies estimating the cost of mitigation and/or liabilities. How much more clear can it be? No definition of the terms used is necessary.

9. Question No. 2 of the Request for Production of Documents was completely disregarded by the Commission's counsel. 52 Pa. Code §5.342(c) states that "(the) statement of an objection does not excuse the answering party from answering the remaining interrogatories or subparts of interrogatories to which no objection is stated."

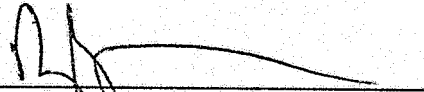
10. The objections and the remaining answers to Question No. 2 are late, under Rule 5.342(d). Objections are to be served

within 10 days of the service of the interrogatories. Answers are to be served within 20 days.

11. The Requests for Production of Documents are not unreasonable and are necessary to Protestants' case. The requests merit compulsion under 52 Pa. Code §5.342(e).

12. The documents are also public documents pursuant to the Right to Know Act.

WHEREFORE, protestants pray that the PUC prosecutorial staff be compelled to produce all documents responsive to Smalls et al requests for Production of Documents.

  
ROBERT J. SUGARMAN  
Counsel for Protestants

OF COUNSEL:

SUGARMAN & ASSOCIATES  
16th Floor, City Place  
101 N. Broad Street  
Philadelphia, PA 19107  
(215) 751-9733

pldngs91\pause.008

EXHIBIT A

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

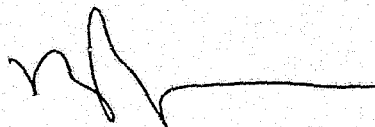
IN RE: LETTER OF NOTIFICATION : DOCKET NO. A-110550F055  
OF PHILADELPHIA ELECTRIC :  
COMPANY UNDER 52 PA :  
CODE § 57.72(d) RE: PROPOSED :  
230 KV WOODBOURNE :  
TRANSMISSION LINE :

REQUEST FOR PRODUCTION OF DOCUMENTS  
BY PENNSYLVANIA PUBLIC UTILITY COMMISSION

Intervenors by their counsel seek production of the following documents from the Pennsylvania Public Utility Commission:

1. All EMF studies available to the Commission.
2. Applicable safety standards for 238 KV transmission lines being constructed new in 1991.
3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985 - 1991.
4. All documents received and/or distributed by the Commission at the EMF seminars, 1985 - 91.
5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards

to deal with EMF, and/or the potential liabilities of not avoiding  
EMF exposure.



---

ROBERT J. SUGARMAN  
Counsel for Intervenors

Date: \_\_\_\_\_

5/31/91

OF COUNSEL:

SUGARMAN & ASSOCIATES  
16TH FLOOR, CITY PLACE  
101 N. BROAD STREET  
PHILADELPHIA, PA 19107  
(215) 751-9733  
pidngs91\pause.006

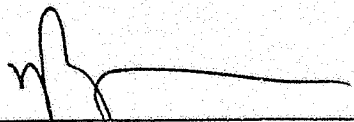
CERTIFICATE OF SERVICE

I, certify that I have caused a copy of the foregoing Request for Production of Documents by Pennsylvania Public Utility Commission to be served on the following by first class mail, postage pre-paid, this date:

Donald Blanken, Esquire  
Philadelphia Electric Company  
2301 Market Street  
P. O. 8699  
Philadelphia, PA 19101

Tanya McCloskey, Esquire  
Office of the Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Pennsylvania Public Utility Commission  
Patricia Krise Burket, Esquire  
John F. Povilaitis, Esquire  
G-28 North Office Building  
Harrisburg, PA 17120

  
\_\_\_\_\_  
ROBERT J. SUGARMAN, ESQ.

Date: 5/31/91

EXHIBIT B

STATEMENT/MOTION OF CHAIRMAN WILLIAM H. SMITH

RE: EMERGENCY PETITION OF NON-NOTICED  
PROPERTY OWNERS TO INTERVENE FOR  
REOPENING AND TO SUSPEND APPROVAL  
A-110550F.055  
L-704\*

Philadelphia Electric Company (PECO) filed its Letter of Notification to reconductor and reconstruct an existing but abandoned 138KV Transmission line for 230KV operation with the Commission on November 21, 1989. Consistent with our regulations, copies of PECO's letter were served on all property owners within the proposed right-of-way, over 29 public officials including those in the governing bodies of Bucks and Montgomery Counties and the municipalities through which the line passes, as well as the planning bodies of each municipality. Several state agencies were also served as required by the Commission's regulations. No protests to PECO's plan were filed with the Commission.

Accordingly, based upon an analysis of the plan and the recommendation of our Bureau of Conservation, Economics and Energy Planning, the Commission approved PECO's unopposed plan on February 1, 1990 (Order entered February 9, 1990). The \$20.1 million project was scheduled to begin in the Spring of 1990 with an in-service date of the Spring of 1991.

On September 14, 1990, an Emergency Petition to Intervene, to Reopen the Record, and to Suspend our prior Approval of this project was filed by members of PAUSE. At the heart of this Petition is the issue of whether the line will create a health risk because of the electromagnetic fields (EMF) generated by the line, although other matters also are raised.

I do not believe that reopening the record and remanding the case for further hearing, particularly with regard to the issue of EMFs, will lead to any resolution of that issue at this time.

The subject of EMFs and the possible detriment they pose to human health has been, is being, and will be studied on a regional and worldwide basis by numerous groups for some time to come, as it should be. One such study undertaken by the National Cancer Institute of childhood leukemia will assess the role of several factors, including EMF. I have listened to EMF presentations at regulatory conferences, read papers written by experts and many news articles on this subject.

While some of the studies tend to suggest that there may be cause for concern and the need for further study, other studies have found that no health hazard exists. Just about all of the studies conclude there is no conclusive proof that there is a causal connection between EMFs and adverse health effects on humans. I believe these observations are also consistent with the recently publicized Review Draft of the U.S. Environmental Protection Agency's Evaluation of the Potential Carcinogenicity of Electromagnetic Fields, a comprehensive review of over 40 existing scientific studies and tests. Included in its summary in the Federal Register (December 18, 1990) is the observation that "There are insufficient data to determine whether or not a cause and effect relationship exists."

The Congressional Office of Technology Assessment (OTA) reportedly has indicated that if EMF does ultimately turn out to be a risk to human health, utility distribution/transmission lines may not be the greatest cause of any potential hazard. Home wiring circuits, lighting fixtures, normal household appliances (toasters, vacuum cleaners, electric ranges, mixers, can openers, blenders, clock radios, black and white TV's, shavers, etc.), and electric blankets create EMFs, and the OTA concluded that these other items (as well as industrial and office workplace exposure) could play a greater role than electric transmission lines in any possible public health problem. A recently made public study at the University of Southern California tends to support this conclusion. Appliances can generate EMFs even higher than those emitted by transmission lines but, in most cases, fall off rapidly with distance and generally do not produce constant exposure.

Further, the experts haven't as yet been able to establish "safe" standards of exposure (dosage/intensity/time duration) to guide us in any remediation because they have not yet determined what threshold levels, if any, are dangerous. Some of the experts say biological effects of EMFs may even be detrimental at lower intensities rather than higher ones. The OTA reportedly has said, on this issue, that reducing the intensities of fields to which people are exposed might even make things worse. That is, simply lowering EMF strength may not reduce any possible risks that may exist.

While experts encourage utilities to design, site and erect new transmission lines so that they avoid residential exposure, and to widen transmission line right-of-ways, and to control the use of land along them, some do not believe the findings to date justify spending millions of dollars, tearing out, rerouting, and rebuilding old lines. I agree that transmission line design and siting must be such that the potential to harm humans is minimized or eliminated if that is possible.

The question then becomes what should we do?

- As precautionary measures, I believe that Pennsylvania's electric utilities have a clear duty to exercise what one team of experts described as a policy of "prudent avoidance" in the design and siting of power lines.

- Qualified health care professionals, utilities and others must continue and intensify the study of this issue until a definite answer is found before embarking on a costly, drastic revision to the electric industry's method of preparing to meet our ever growing demand for energy.

- Utilities and others must continue research on and utilize available engineering options that can reduce the strength of and lessen exposure to EMFs from transmission/distribution lines.

- Where economically and otherwise feasible, for example, the use of taller poles and some undergrounding of lines should be considered, along with wider rights-of-way.

- Utilities should develop programs to provide relevant information to customers as it becomes available, including field and frequency measurements.

- The P.U.C. staff must review our regulations governing all of these areas to recommend changes to assist in minimizing any potential EMF hazard, as well as our "notice" requirements.

- Our staff has advised us that the American National Standards Institute (ANSI) will be issuing guidelines for occupational and residential exposure to EMF in April or May of 1991, and these guidelines should afford the Commission additional guidance in whatever regulatory measures it deems necessary to undertake to address this issue.

The Report of the Pennsylvania House Conservation Committee's Study of Electro Magnetic Fields Pursuant to House Resolution 38 (November 30, 1990) reaches similar conclusions. The Committee's report states that "Because the scientific community does not indicate a clear causal connection between electromagnetic fields and both cancer and leukemia, it appears to be premature for Pennsylvania to label electromagnetic fields as health hazards without further study." Further, the report finds that "Additional technical research should be conducted before any action, including any regulatory action, is taken." The report recognizes "the wide scope and far-reaching implications of this problem" and recommends "additional study by the federal government or the international community." The report concludes that "While the existence of electromagnetic fields affecting cells is not in question, whether they pose health risks to humans or not remains unknown" and it

directs the Department of Environmental Resources and the Department of Health to continue to research relevant literature. Other departments are to monitor and remain current with all fields of research. Finally, the report concludes that "At this point, it is the sense of the Conservation Committee that any action beyond research is premature."

Accordingly, I move the adoption of L-704.

March 5, 1991

Date

W<sup>H</sup> H. Smith

William H. Smith  
Chairman

PENNSYLVANIA PUBLIC UTILITY COMMISSION  
Harrisburg, Pennsylvania 17120

PUBLIC MEETING - MARCH 6, 1991

EMERGENCY PETITION OF NON-NOTICED  
PROPERTY OWNERS TO INTERVENE FOR  
REOPENING AND TO SUSPEND APPROVAL

A-110550F.055  
L-704\*

STATEMENT OF COMMISSIONER WENDELL F. HOLLAND

I support the Chairman's Motion and the staff report and would like to note a few things for the record.

First, I am concerned about the environmental and health effects posed by EMF. Evidence of my concern was shown just last week at the winter meetings of the NARUC. As a member of NARUC's Committee on Electricity, I seconded a motion in support of a \$25 million, three-year study into the possible health effects of EMF. The motion, which was ultimately adopted by the full NARUC, further provided that NARUC and three electric utility trade associations - namely, the American Public Power Association, the Edison Electric Institute and the National Rural Electric Cooperative Association - support a joint research effort to be "undertaken by highly respected independent research institutions that have a proven ability to conduct health-related research." (Resolution on EMF Research, Resolution Paragraph, NARUC No. 9-1991, p. 21).

Second, along with four members of my staff, I conducted a site visit to the proposed line directly within the right-of-way of PECO's line construction in order to gain a greater appreciation of the overall environment.

Finally, as a former Judge, I am compelled to pay particular attention to relevant precedent. I note that in previous transmission line siting cases where the potential threat of EMFs was an issue, this Commission considered "immaterial" broad allegations regarding possible adverse health effects from transmission line construction, as opposed to site specific studies or more concrete evidence. Bethel Township, Docket No. A-110550F049, Mimeo p. 14 (Order entered May 16, 1990); see also East Goshen Township, Docket No. A-00110550F022, Mimeo pp. 4-5 (Order entered September 6, 1989). Moreover, the utility Commissions in Maryland and New Jersey--our neighbors to the south and east--have permitted construction of transmission lines after extensively reviewing the medical evidence relative to the alleged health hazards associated with EMFs. Re Potomac Electric Power Company - Brighton Substation to High Ridge Substation, Docket No. 7004 (Order of December 21, 1989); Re Jersey Central Power and Light Company, 115 PUR 4th 542, Docket No. EE 89020154 (Order of July 12, 1990).

For these reasons, I support the Chairman's Motion to Deny the Petition for Stay and Rehearing. I would, however, grant standing to the petitioners to participate in the GPU/Duquesne Light siting application to further explore issues pertaining to possible health risks associated with EMF exposure.

3/6/91

Date

Wendell F. Holland

WENDELL F. HOLLAND  
Commissioner

EXHIBIT C

PENNSYLVANIA  
PUBLIC UTILITY COMMISSION  
Harrisburg, PA 17120

Public Meeting Held March 6, 1991

Commissioners Present:

William H. Smith, Chairman  
Joseph Rhodes, Jr., Vice-Chairman, dissenting  
Frank Fischl  
Wendell F. Holland  
David W. Rolka, dissenting (Opinion attached)

Emergency Petition of Non-Noticed Property  
Owners to Intervene For Reopening and  
To Suspend Approval.

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.,<sup>1/</sup> filed to intervene in the above-captioned docket involving the siting application of Philadelphia Electric Company relative to reconductoring and rebuilding an existing 138 kV line to operate as the Woodbourne-Heaton 230 kV line in Montgomery and Bucks County.<sup>2/</sup> The Petitioners also requested that the record be reopened in this matter and that Commission approval for reconstruction of the line be suspended.

In support of the petition, Petitioners aver that they are affected property owners, that they did not receive actual notice of PECO's letter of notification, and that their property rights would be damaged by the reconstruction. Petitioners also aver that had they the opportunity to intervene in this matter, they would have presented the following issues: whether the proposed line was needed; whether the line would create a health risk because of the intrusion of electromagnetic fields (EMF) generated by the line on Petitioners' property through encroachment on their airspace; and whether the proposed line would negatively affect

<sup>1/</sup> Petitioners aver that they are members of a Pennsylvania non-profit corporation, Parents Against an Unsafe Environment (PAUSE).

<sup>2/</sup> The Commission granted PECO approval to rebuild this line by order entered February 9, 1990.

aesthetics, would cause interference with television or radio reception, would heighten the potential for destructive fires, and would depreciate their property values. The Petitioners also allege that they would prove that the letter of notification procedure was erroneously used in this case because of PECO's misstatement of critical facts; specifically, the Petitioners allege that this line is not being rebuilt and that this proposed line, in fact, was PECO's first and only line to be constructed on this land. Petitioners also allege that the proposed line violates local zoning ordinances and that reconstruction of the line constitutes "inverse condemnation,"<sup>3/</sup> by taking Petitioners' property without due process. The Petitioners conclude by stating that they have contacted PECO, and PECO has talked to them about their concerns, but that PECO "has wholly refused to consider any means of satisfaction, specifically including withholding further construction activities", pending the Commission's action reopening the proceeding. The Petitioners request that the Commission allow them to intervene in the proceeding, reopen the proceeding and suspend PECO's authority to proceed with reconstruction of the line.

On September 18, 1990, PECO filed an Answer to the petition requesting that it be denied. PECO's answer denies that the Petitioners own property rights which will be affected by construction of the 230 kV transmission line because none of the Petitioners own property within the transmission line right-of-way. PECO also avers that it clearly and accurately stated the facts as it advised the Commission that it proposed to rebuild and reconductor an abandoned railroad 138 kV transmission line. PECO explains that it purchased the structures used to support the 138,000 volt line which had de-energized conductors in place. PECO's answer also disputes the fact that reconstruction of the transmission line will interfere with any of property rights of the Petitioners, wherever they are located. PECO avers that the Petitioners were not entitled to actual notice of the Letter of Notification filing under 52 Pa. Code §57.72(c)(4) because they did not own property within the proposed right-of-way. PECO also notes in its answer that notice was given to over 25 public officials including those in the governing bodies of Bucks and Montgomery Counties and all municipalities through which the line passed, as well as the planning bodies of each municipality. PECO states that copies of the Letter of Notification were filed with municipal officials not so much for the purposes of local zoning law, but to comply with Commission regulations. PECO avers that several state agencies were also served in accordance with Commission regulations.

In answer to the issues which Petitioners allege that they would have addressed at hearing, PECO replies that (a) the necessity for this line has been described in PECO's Letter of Notification; (b) that the

<sup>3/</sup> Inverse condemnation is defined as "a cause of action against a government agency to recover the value of property taken by the agency, though no formal exercise of the power of eminent domain has been completed." Black's Law Dictionary 424 (5th ed. abridged 1983).

Commission has the expertise to address any issue involving the risk of health hazard alleged to be caused by electromagnetic fields produced by transmission lines; and (c) that the Commission has plenary jurisdiction over the safety of the proposed line and from its expertise in the area is thoroughly versed on all aspects of safety related to transmission lines. PECO also avers that any material presented concerning the reduction of Petitioners' property values by the reconstruction of this line is outside the Commission's jurisdiction as is the issue of "inverse condemnation." PECO then states in its answer that PECO has attempted to answer the Petitioners' questions regarding construction of the transmission line at public meetings.

PECO also argues that the Petitioners have not alleged any new evidence that they would present (if given the opportunity to do so), but have merely made the typical allegations or concerns regarding safety, aesthetics, interferences with reception, potential for fires, reduction of property values and health effects. These allegations, PECO continues, have been made time and time again in all transmission line cases, and there is nothing new in the Petitioners' offer to present these issues.

PECO further argues that if there is an improper "taking" of property rights, the courts are available to decide this matter and that the proceeding on PECO's Chapter 57 siting application should not be reopened nor should construction of the line be halted based upon this allegation.

PECO states that its use of the Conrail right-of-way and structures which carried 138 kV transmission facilities in the past is a natural use of the corridor methodology which this Commission has approved in the past. In fact, PECO states that these corridors are natural highways for PECO's transmission lines and that PECO has hundreds of miles of transmission lines along the rail corridors in its territory. PECO argues that in its highly urbanized territory, new transmission line corridors are a thing of the past and it must look to railroad corridors to deliver the bulk of its power to substations which will be in turn carried in distribution lines on the streets and highways to homes. Without the ability for PECO to use railroad right-of-ways to carry the bulk of its electric power, PECO concludes that the public's electric service would be placed in serious jeopardy. For these reasons, PECO requests that the Petitioners' petition to intervene, reopen and suspend should be denied.

On December 27, 1990, the Petitioners filed a letter dated December 19, 1990 which purportedly supports their petition.<sup>4/</sup> In the letter, the Petitioners restate their allegation that PECO mischaracterized the line as a reconstruction and enlargement when it was instead new line. The letter also alleges that PECO was not accurate in its representations as to the extent of the new right-of-way. Specifically, the letter continues that:

---

<sup>4/</sup> Although this letter was not verified as required by 52 Pa. Code §1.36, we will, nevertheless, consider the letter's allegations so that we can more efficiently dispose of this petition.

[t]he right-of-way departs from the Conrail right-of-way and proceeds several hundred feet north perpendicular to the right-of-way on totally new right-of-way. It then turns another right angle to the last and proceeds at least 900 feet on totally new right-of-way. In doing so, the line passes within 40 feet of an employee occupied building.

Letter dated December 19, 1990, p. 1.

The letter also expresses concern over what the petitioners perceive as a redoubling of PECO's efforts to complete the line and states that this push is inconsistent with the "preapproval approach [for transmission lines] underlying Commission regulations" (letter dated December 19, 1990, p. 2). The letter directs, without comment, the Commission's attention to the report issued by the Environmental Protection Agency on electromagnetic risk.

On January 3, 1991, the Office of Consumer Advocate (OCA) filed a Notice of Intervention and a statement in support of the emergency petition. In its statement, the OCA takes no position on the merits of the petition, nor on the Petitioners' claims with respect to the potential dangers of increased exposure to EMF, but does support the Petitioners' procedural request for a hearing to air their concerns. However, the OCA does argue that the difference between 230 kV, which is the voltage for PECO's proposed Woodbourne-Heaton line and zero voltage, which is currently the voltage of the abandoned Conrail line, represents a substantial change in the right-of-way which should have resulted in the Commission rejecting PECO's letter of notification and requiring PECO to file an application for the line. 52 Pa. Code 57.72(d)(5). As OCA's argument goes, had PECO been required to file an application, it would have been required to publish notice of the hearing in the local newspaper and Petitioners would have had notice of the hearing so that they could have voiced their concerns.

On January 4, 1991, the Board of Commissioners of Upper Moreland Township, Montgomery County, filed a letter dated December 27, 1990 requesting that the Commission reconsider its decision granting the Letter of Notification for the Woodbourne-Heaton line. Its request in this matter was prompted by a speech which was presented to them a week earlier by a representative of PAUSE (Letter dated January 4, 1991, p. 1).

On January 2, 1991, PECO filed an answer in response to the Petitioners' supplemental letter in which the Company explained that it had described the Woodbourne-Heaton project as clearly as it could "to the P.U.C. and all the municipalities through which it traverses" (PECO's answer, dated January 2, 1991, p. 1). PECO explains that its Letter of Notification

described all of the abandoned railroad facilities to be removed from the supporting structures and the new facilities to be installed by PECO

and disclosed that

it had purchased property (about two acres) which lay between its Woodbourne Substation and the railroad and that this property would be used to divert the line from the railroad to the substation

PECO's answer, dated January 2, 1991, p. 1.

On January 10, 1991, PECO filed its reply to OCA's statement in support of the Petitioners' request for a hearing in this matter. In its reply, PECO follows-up on OCA's argument that had the Commission required PECO to go through the application process for this line, the Petitioners would have had general notice via newspaper publication of the line and further remarks that it would seem that OCA preferred general notice via newspaper publication over the actual notice which PECO gave to all municipalities through which the line passes. In fact, PECO states, it served notices on three different public officials in each township which the line was to traverse--the Township Manager, the Chairman of the Board of Supervisors and the Chairman of the Planning Commission of Lower Southampton Township, Upper Southampton Township, Middletown Township, Upper Moreland Township, Lower Moreland Township and Northampton Township. Additionally, PECO avers that copies of the Letter of Notification were sent to four different public officials in the "Borough" of Langhorne--the Mayor, Council President, Borough Secretary and the Chairperson of the Planning Commission. PECO also states that public officials in the Counties of Bucks and Montgomery as well as four state officials -- the Secretary of the Department of Environmental Resources, the Secretary of the Department of Transportation, the Chairperson of the Pennsylvania Historical and Museum Commission and an official of the Pennsylvania Department of Property and Supplies--were served with a copy of PECO's Letter of Notification. In total, PECO avers that it served a copy of the Letter of Notification on 29 different public officials who are charged with protecting the health, safety and welfare of the citizens of Pennsylvania and no protests were received. PECO argues that service on 29 public officials is sufficient notice of this project.

In further response to OCA's argument that the public was not given notice, PECO states that the Commission's regulations at 52 Pa. Code §57.72(c)(4) require notice only to those persons owning property within the right-of-way regardless of whether there is an application or a letter of notification proceeding involved. Even if it had filed a siting application, PECO argues, it would not need to serve the Petitioners with a copy of the application because they own no property within the right-of-

way; PECO had acquired all the property within the proposed right-of-way before filing its Letter of Notification. PECO then argues that the filing of a protest is the only thing that would ensure a hearing, 52 Pa. Code §57.75(h), and that actual service on 29 public officials did not result in a protest which would be grounds to hold a hearing. PECO finally argues that the Commission, which has jurisdiction over the safety of electric transmission lines, adequately considered all elements of safety in approving the Letter of Notification for the Woodbourne-Heaton 230 kV line, and concludes that OCA has presented no basis for reopening the record in this proceeding to conduct hearings.

Reopening and Reconsideration of a Commission final order is governed by Section 703(g) of the Public Utility Code, 66 Pa. C.S. §703(g), which reads in part:

- (g) Rescission and amendment of orders. -- The commission may, at any time, after notice and an opportunity to be heard as provided in this chapter, rescind or amend any order made by it.

Under Section 703(g), the Commission's power to

grant a petition for reconsideration is discretionary and mere disagreement with a commission decision is insufficient reason to grant reconsideration; rather, factors such as a change in circumstances or newly discovered evidence unavailable at the initial determination may be relevant in determining whether to grant the petition for reconsideration and the commission may also consider whether the petition addresses new and novel arguments previously overlooked.

Kea v. Peoples Natural Gas Company, 60 Pa.PUC 215, 216 (1985).

In disposing of the instant controversy, the Commission believes that it should first address the "due process" issue raised by the Petitioners to determine if reconsideration of this decision, and reopening of this case, is warranted. In their petition, the Petitioners alleged that they are affected property owners but they were not served with a copy of PECO's Letter of Notification and did not have notice of the Commission proceedings. Although the Petitioners admit they do not own property within the right-of-way, they nevertheless base this claim of being affected property owners on ownership of air space adjacent to the vertical dimensions of the railroad right-of-way acquired by PECO for this project.

Commission regulations at 52 Pa. Code §57.74(d)(3) require service of copies of a letter of notification on those persons designated

under 52 Pa. Code §57.75(c)(4). This regulation refers to 52 Pa. Code §57.72(c)(4) which directs service of such documents on ". . . persons, corporations and other entities of record owning property within the proposed right-of-way." Because the Petitioners do not own property in the railroad right-of-way acquired by PECO, PECO was not required to serve a copy of its application upon them.

As to Petitioners' claim involving air space, Petitioners assert that they have a property interest as follows in the property to be occupied by PECO's facility:

fee simple title to a vertical portion of the right-of-way proposed to be used, as to all individual petitioners, ownership of the air space intended to be occupied by the proposed facility for dispersion of electromagnetic waves; and ownership of air space adjacent to the proposed transmission lines, which said petitioners have used for the growth of tall trees in their air space outside the vertical dimensions of the proposed right-of-way.

Petition p. 2, para. 7.

The Commission does not believe that the Petitioners' ownership of air space adjacent to the right-of-way requires PECO to serve each claimed individual adjacent property owner with a copy of its Letter of Notification.

Regarding the Petitioners' claim of ownership of additional air space over the vertical portion of the right-of-way, the Commission is perplexed. While it is true that the Petitioners can assert a valid property interest in the air space above boundaries of their property<sup>5/</sup>, and that under Pennsylvania state law air rights may be severable from surface ownership, 68 P.S. §801,<sup>6/</sup> the Commission cannot imagine a basis

---

<sup>5/</sup> As recognized by the United States Supreme Court in United States v. Causby, 328 U.S. 256, 264, 66 S.Ct. 1062, 90 L.Ed. 1206 (1946), "[t]he land owner owns at least as much of the space above the ground as he can occupy or use in connection with the land." See also, Hinman v. Pacific Air Transport, 84 F.2d 755 (9th Cir. 1936).

<sup>6/</sup> §801. Conveyance and transfer  
Estates, rights and interest in air space above the surface of the ground in the Commonwealth, whether or not contiguous to the surface of the ground, may be validly conveyed or otherwise transferred to a person or persons other than the owner or owners of the surface below.  
Section 1 of the Act of August 14, 1963, P.L. 871, 68 P.S. §801.

for the Petitioners' claim to fee simple title to air space above PECO's right-of-way. The air space above the right-of-way must clearly belong to PECO unless the air rights were expressly severed from the surface rights at the time of the creation of Conrail's right-of-way and we have no indication that this was so. Accordingly, the Petitioners do not own property, either in the air or at the surface, in the proposed transmission line's right-of-way, and PECO was not required under Commission regulations to provide a copy of its Letter of Notification to the Petitioners. Therefore, Petitioners' claim of the denial of due process is invalid and does not support their request to reopen this record.

Also in support of their request to reopen the instant proceeding, the Petitioners allege that they would prove that PECO had erroneously used the letter of notification procedure in this case because of PECO's misstatement of critical facts. The Petitioners argue that PECO was not reconstructing this line because it had never constructed a line on this property before. In its letter supplementing its petition, the Petitioners also allege that PECO was not accurate in its representation regarding the extent of the new right-of-way it had to acquire for the line.

The Commission, however, was fully apprised of the circumstances surrounding PECO's reconstruction of this line. PECO stated in its Letter of Notification that it proposed to rebuild and reconductor an abandoned railroad 138 kV transmission line. It stated that it purchased the Conrail right-of-way and the existing structures which had supported the line and would use 176 of the 236 existing structures in the rebuilt line.

In its Letter of Notification, PECO also stated that:

Woodbourne Substation property abuts the north property line of Conrail's Trenton Cut-Off Branch. Just west of the substation and abutting the railroad property on the south side is Buehl Field Airport. Existing railroad structures cannot be used in this area due to the required height limitations near the airport runway.

PECO has purchased a two (2) acre vacant, irregular shaped property which separates the substation property from the railroad. This property will be used to divert the line from the railroad into the substation prior to reaching the approach to runway 24 at Buehl Field. This will greatly reduce or eliminate conflict with the runway.

PECO's Letter of Notification, p. 5.

In its Letter of Notification, PECO also discloses that the two acre parcel of land will contain a 0.06 mile section of the line (PECO's Letter of Notification, p. 3). Under the circumstances, PECO did not misrepresent the route of the right-of-way for its proposed line.

Furthermore, in its letter of notification, PECO stated that it was proceeding pursuant to Sections 57.72(d)(1)(iv) and 57.72(d)(1)(v) of the Commission's regulations. Section 57.72(d)(1)(iv) provides that the letter of notification procedure may be used where

[a] line for which the voltage is proposed to be increased above its present levels, so long as the size, character, design or configuration of the proposed line does not substantially alter the right of way

52 Pa. Code §57.72(d)(1)(iv) (emphasis added).

Section 57.72(d)(1)(v) provides that the letter of notification procedure may also be used where

an HV line which is to be reconducted or reconstructed so long as the size, character, design or configuration of the proposed HV line does not substantially alter the right of way.

52 Pa. Code §57.72(d)(1)(v). (emphasis added).

Because PECO intended to reconductor or rebuild an existing high voltage transmission line, PECO's use of the letter of notification procedure was not erroneous. That the line must travel along 0.06 mile section of new right-of-way (which was not part of the original Conrail line) to avoid conflicts with the use of an airport runway does not substantially alter the right-of-way of the original line so as to preclude PECO's use of a letter of notification in this proceeding.

However, in its statement, the OCA argues that the difference between the proposed 230 kV line and zero voltage, currently the voltage of the abandoned Conrail line, represents a substantial change in the right-of-way which should have warranted PECO filing an application for this line. We disagree. Although the Conrail transmission line has not been recently in use and has been at zero voltage for this period of time, it originally operated at 138 kV. Thus, the Petitioners cannot rely on the expectation or the presumption that the voltage on this transmission line would remain at zero indefinitely. As reflected in the Commission's prior order approving PECO's Letter of Notification, the increase from 138 kV, the original operating voltage of the Conrail line to 230 kV, the voltage for the proposed PECO line, was deemed not to have significantly altered the original Conrail right-of-way (Order entered February 9, 1990 at

A-110550, F.055, p. 3). Under the circumstances, both PECO's use of the letter of notification and the Commission's approval thereof are factually supportable.

Finally, it is important to note that Commission regulations do not require that the high voltage transmission line be one that was owned or used by the electric utility which is proposing the reconstruction.<sup>7/</sup> Therefore, PECO's not previously owning the Conrail transmission line it now proposes to rebuild has no effect on PECO's ability to proceed under the Commission regulations governing letters of notification.

Petitioners also allege that the proposed line violates local zoning ordinances. However, public utilities facilities such as reservoirs, electric transmission lines, etc., are not subject to local zoning ordinances; only public utility buildings are.<sup>8/</sup> Upper St. Clair v. Delaware and Hudson Railway Company, 19 Pa. Commonwealth Ct. 59, 339 A.2d 155 (1975). Therefore, the Petitioners allegation concerning PECO's noncompliance with local zoning laws is meritless.

In their petition, the Petitioners do not raise any new evidence not discoverable at the time of initial Commission consideration of PECO's letter of notification, nor do they claim changed circumstances which would support a request to reopen the record. Instead, they assert that had they been given the opportunity to participate in a hearing on PECO's Letter of Notification, they would have raised the following issues: the need for the line, public health and safety aspects of the line, and aesthetics.<sup>9/</sup>

In considering the approval of siting applications or letters of notification, Commission regulations at 52 Pa. Code §§72.1, et seq., require the Commission to consider the issues raised by the Petitioners as

---

<sup>7/</sup> For that matter, Commission regulations do not require that the line to be reconstructed be used for the purpose of providing utility service to the public. In this case, however, this line was previously owned and operated by Conrail and for many purposes, railroads, including Conrail, are classified as public utilities under 66 Pa. C.S. §102.

<sup>8/</sup> Moreover, under the "Pennsylvania Municipalities Planning Code," 53 P.S. §§10101, et seq., public utility buildings may be exempted from local zoning laws on a finding of public necessity by the Commission. 53 P.S. §10619.

<sup>9/</sup> The Petitioners contend that they would have also raised the issue of depreciation of their property values caused by the electric transmission line, and that in fact their properties were taken by "inverse condemnation". However, these issues are outside the Commission's jurisdiction. Thus, the desire of the Petitioners to raise this issue at a hearing is irrelevant and does not support their request to reopen the record.

well as other environmental factors. In its order on PECO's Letter of Notification, the Commission considered public need for the proposed line, and we stated that the proposed line would "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 9, 1990 at A-110550, F.55, p. 2. The Commission's order also stated that the need for this back-up line was precipitated by the area's high load growth which also required the expansion of distribution facilities as well as the construction of new distribution facilities. Id. at pp. 2-3. As to safety of the line, the Commission noted that the line would be designed, constructed and maintained in accordance with the National Electric Safety Code and that minimum standards would be met or exceeded. Id., p. 3.

Aesthetics and environmental impact of the proposed 230 kV were also considered by the Commission in finding that the existing utility right-of-way was not significantly altered by PECO's reconstruction of Conrail's 138 kV line.

Analysis of the foregoing detail reveals that in this case, PECO proposes to utilize an existing utility corridor on which there is erected an existing (but now abandoned) 138 kV transmission line as a common corridor for the proposed 230 kV transmission line. Consequently, the rebuilding and reconductoring of the existing 138 kV transmission line into a single circuit 230 kV transmission line utilizing most of the existing support structures will not alter the existing right-of-way. Moreover, the now-abandoned railroad electrification is more than 50 years old, and most of the industrial and residential properties adjacent to the railroad right-of-way were constructed with the railroad transmission line and catenary system already in place, implying at least some acceptance thereof.

Id., p. 3.

The issues which the Petitioners would allegedly have raised if they had been given the opportunity have already been considered by the Commission in approving PECO's Letter of Notification on the Woodbourne-Heaton 230 kV line. Therefore, Petitioners have not raised any new or novel arguments which have not been considered by this Commission in this proceeding or any other proceeding on electric transmission lines. Although the Petitioners also allege a need to address EMF issues not heretofore expressly considered by the Commission in approving the PECO Letter of Notification, as we will discuss below, this issue is inappropriate and does not present significant basis upon which to reopen the siting proceeding.

Because the Petitioners have failed to prove sufficient grounds for reopening the record in this case, their petition must be denied. As we have denied the Petitioners' request to reopen this proceeding, it is unnecessary to address their request to intervene. However, it is important that we rule on Petitioners' request for a stay.<sup>10/</sup>

In Pennsylvania Public Utility Commission v. Process Gas Consumers Group, 502 Pa. 545, 467 A.2d 805 (1983), the Supreme Court of Pennsylvania held that the standards for the issuance of a stay are those set forth in Virginia Petroleum Jobbers Assoc. v. Federal Power Commission, 104 U.S. App. D.C. 106, 259 F.2d 921 (1958), as refined in Washington Metropolitan Area Transit Commission v. Holiday Tours, Inc., 559 F.2d 841 (D.C. Cir. 1977). Under the Virginia Jobbers criteria, the grant of a stay is warranted if:

1. The petitioner makes a strong showing that he is likely to prevail on the merits;
2. The petitioner has shown that without the requested relief, he will suffer irreparable injury;
3. The issuance of a stay will not harm other interested parties in the proceeding;
4. The issuance of a stay will not adversely affect the public interest.

The first criteria, whether applicant is likely to prevail on the merits, is not really applicable in matters being decided by a governmental agency since it may be presumed that this Commission correctly decided the case, and that if appealed, the Commission would succeed on the merits. Furthermore, as already explained, PECO has proven need for this line and did not improperly use the letter of notification procedure.

The second prong of the test is that the Petitioners must show that unless PECO is ordered to halt construction (pending whatever legal action the Petitioners deem is appropriate to take), the Petitioners will suffer irreparable harm. While it is true that the Petitioners did not

---

<sup>10/</sup> We granted PECO authority to construct this line on February 9, 1990, and this authority has not yet been revoked. Thus, under the circumstances, PECO's continued construction of the line is not inconsistent with "the preapproval approach" of our regulations as was contended by the Petitioners in their supplemental letter.

specifically identify the harm they will suffer if their request to halt construction would not be granted, the Petitioners<sup>11/</sup> did raise questions about the risks of electromagnetic forces (EMF).

Although the Commission has not independently investigated the issue of EMF, it is well apprised of current scientific thought on this subject. We, therefore, cannot agree with the Petitioners' conclusion that EMF from high voltage transmission lines represents an acknowledged health risk.<sup>12/</sup> The overwhelming consensus in the technical community, after review of available epidemiological and scientific studies, is that there is no conclusive evidence of the adverse health effects associated with EMF from electric transmission lines.<sup>13/</sup>

As to the EPA report on EMF and cancer mentioned in the Petitioner's supplemental letter,<sup>14/</sup> the report is merely a preliminary draft, informally released to the public as a result of its being reviewed by the Nonionizing Electric and Magnetic Fields Subcommittee of the Science Advisory Board's Radiation Advisory Committee (55 Fed. Reg. 51957). This preliminary draft does not represent the EPA's final position or policy on EMF as a potential carcinogen, *Id.*, and cannot be used to support the Petitioners' claim about the adverse health risk created by EMF from transmission lines. Therefore, the Petitioners have not shown that they will suffer irreparable harm if construction of the PECO's Woodbourne-Heaton 230 kV line is not halted.

<sup>11/</sup> The Petitioners also aver that they will suffer a reduction in property value, and that building the line would be the equivalent of taking their properties by inverse condemnation. However, as already explained, the Commission does not have the authority to address these two issues and thus, cannot evaluate the injury which the Petitioners allege they will suffer.

<sup>12/</sup> Two recent comprehensive articles on the biological effects of EMF support the Commission's position of the inconclusiveness of these effects. Fitzgerald, Morgan, and Nair, "Electromagnetic Fields: the jury's still out", IEEE Spectrum, August 1990, at 22; and Harunuzzaman, "Overview of Scientific Research on Electromagnetic Fields and Human Health", NRRI Quarterly Bulletin, V. II, No. 3, at 247.

<sup>13/</sup> The Conservation Committee of the House of Representatives also reached this conclusion after reviewing available scientific and epidemiological studies and testimony received at a public hearing. The Committee, which was advised by staff members from the Department of Environmental Resources and the Health Department, issued a report on November 30, 1990 which stated that it appeared "to be premature for Pennsylvania to label electromagnetic fields as health hazards without further study." (Report of the House Conservation Committee Study of Electromagnetic Fields Pursuant to House Resolution 38, p. 15).

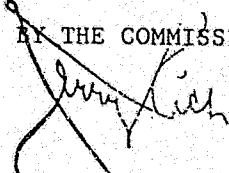
<sup>14/</sup> U.S. Environmental Protection Agency, "Evaluation of the Potential Carcinogenicity of Electromagnetic Fields," External Review Draft, EPA/600/6-9/005B, October 1990.

As to the third and fourth prongs of the Virginia Jobbers test, the Commission has already found public need for the reconstruction of the old Conrail electric line. Thus it would be inconceivable that halting construction of this line would not adversely affect PECO (an interested party in this proceeding) or the public interest.

The Commission appreciates the Petitioners' concerns about the possible adverse health affects that have been attributed to EMF exposure in some studies and understands their collective desire to express these concerns. However, the Commission also recognizes that this issue is currently unresolvable and that more study on EMF is needed. We do not see the economy of reopening a proceeding on a letter of notification which substantially complies with our regulations on electric transmission line siting for the sole purpose of investigating what is at this time an unresolvable issue; THEREFORE,

IT IS ORDERED: That the Petitioners' Emergency Petition to Intervene, For Reopening and to Suspend Approval be and is hereby denied.

BY THE COMMISSION,



Jerry Rich  
Secretary

(SEAL)

ORDER ADOPTED: March 6, 1991

ORDER ENTERED: **MAR 8** 1991

CERTIFICATE OF SERVICE

I, Robert J. Sugarman, certify that I have mailed a copy of the foregoing Motion by first class mail postage pre-paid to the following:

Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Asst. Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esq.  
Penna. Public Utility Commission  
G-28, North Office Bldg.  
P.O. Box 32265  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202, 6723 Whittier Avenue  
McLean, VA 22101  
(OCA Consultant)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101



\_\_\_\_\_  
ROBERT J. SUGARMAN

Dated: 8/7/91

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P. O. BOX 3265, HARRISBURG, Pa. 17120

ORIGINAL  
August 12, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

RECEIVED

AUG 12 1991

Jerry Rich, Secretary  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17112

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 Rich:

Enclosed please find an original and two copies of the  
Prosecutory Staff's Answer to Protestants' Motion to Compel  
Responses. Copies of this Answer have been served on all parties  
of record on this date as evidenced by the attached Certificate of  
Service.

Sincerely,

*Patricia Krise Burket*

Patricia Krise Burket  
Assistant Counsel

Enclosures

cc: All parties of record  
ALJ Smolen

NVL

ORIGINAL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

Docket No.  
A-110550, F.055

DOCKETED  
AUG 13 1991

RECEIVED

AUG 12 1991

PROSECUTORY STAFF'S ANSWER  
TO PROTESTANTS' MOTION TO  
COMPEL RESPONSES

SECRET  
Public Utility Commission

Pursuant to 52 Pa. Code §5.342(e)(1), the Prosecutory Staff files its Answer to the Protestants' Motion to Compel Responses in the above-captioned proceeding, and avers the following:

1. On May 31, 1991, the Protestants made requests for production of documents directed to the Commission.
2. On June 26, 1991, the Prosecutory Staff entered its appearance in the above-captioned proceeding, and on July 12, 1991, filed objections to four of the Protestants' production requests on the grounds, inter alia, that they were overly broad, vague, outside the scope of discovery and overburdensome. A copy of these objections is attached as Annex A, and the arguments contained therein are incorporated by reference.
3. The Protestants' Production Requests, to which the Prosecutory Staff filed objections, read as follows:
  1. All EMF studies available to the Commission.

3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985-1991.
4. All documents received and/or distributed by the Commission at EMF seminars, 1985-1991.
5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards to deal with EMF, and/or potential liabilities of not avoiding EMF exposure.

On July 16, 1991, the Prosecutory Staff filed its Answer to Production Request No. 2 (attached as Annex B).

4. Although the Prosecutory Staff incorporates by reference the arguments against production it already made in its objections, the Prosecutory Staff believes that there are two general points worth repeating. First, the Protestants' production requests are overly broad, making production of the requested documents burdensome. All of the documents requested are not in the exclusive possession of the Commission and may be obtained from any number of alternate sources. Therefore, it would seem that the only basis for the Protestants making a request to produce all EMF studies or all economic studies is so that the Prosecutory Staff can assist the Protestants with their research in this proceeding. Moreover, under Commission rules, participants answering interrogatories are under a continuing obligation to update their answers to interrogatories. 52 Pa. Code §5.332. This rule would seem to obligate the Prosecutory Staff to produce for the

Protestant every new document on EMF which comes into its possession or the possession of anyone else at the Commission. Were that to happen, the Prosecutory Staff would indeed become Protestants' research librarian.

Moreover, under 66 Pa. C.S. §333(d), interrogatories directed to the Commission shall be allowed only upon an order of the Commission based upon a specific finding that the interrogating party is seeking significant, unprivileged information not discoverable by alternate means. Because the requested documents on EMF are available by alternate means, a finding to the contrary cannot be made which would allow the Commission to answer this request.

The second point which need reemphasis is that the Commission's prior knowledge or present knowledge about the EMF issue is irrelevant to this proceeding because the issue will be decided on the record made in this proceeding. Furthermore, to the extent that the Prosecutory Staff's knowledge of EMF, which will be used in its cross-examination of expert witnesses in the proceeding, is gleaned from documents on EMF in its possession, these documents are protected from discovery under the broad category of "attorney work product", 52 Pa. Code §5.323. 52 Pa. Code §5.323 reads in part as follows:

§5.323. Trial preparation material.

(a) Generally. Subject to this subchapter, a participant may obtain discovery of any matter discoverable under §5.321(b) (relating to scope) even though prepared in anticipation of litigation or hearing by or for another participant or by or for that other participant's representative, including his attorney, consultant or agent. The discovery

shall not include disclosure of the mental impressions of a participant's attorney or his conclusions, opinions, memoranda, notes, summaries, legal research or legal theories. With respect to the representative of a participant other than the participant's attorney, discovery shall not include disclosure of his mental impressions, conclusions or opinions respecting the value or merit of a claim or defense or respecting strategy, tactics or preliminary or draft versions of written testimony or exhibits, whether or not final versions of the testimony or exhibits are offered into evidence.

In the instant case, the Prosecutory Staff's own research on EMF is comprised of notes and a file of documents on EMF -- documents which are all available to the general public. The absence of presence of any single report or study in the Prosecutory Staff's research would tend to convey to the Protestants the Prosecutory Staff's mental impressions, conclusions and opinions involving the EMF issue as well as its legal strategy. Therefore, these documents on EMF in the possession of the Prosecutory Staff fall outside the scope of discovery.

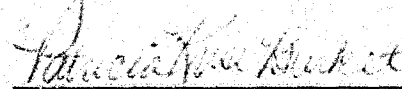
5. One final point must be made. The Prosecutory Staff finds it incredible that Protestants state that the documents requested are public documents which are subject to the "Right to Know Law" (Protestants' Motion, p. 5). While newspaper and magazine articles, journal reports and the majority of studies conducted with the use of public funds are public documents, admissible for evidentiary purposes in Commission proceedings under 52 Pa. Code §5.406, they are not "public records" subject to the "Right to Know Law", 65 P.S. §66.1. Under 65 P.S. §66.1, "public records" are defined as:

Any account, voucher or contract dealing with the receipt or disbursement of funds by an agency or its acquisition, use or disposal of services or of supplies, materials, equipment, or other property and any minute, order or decision by an agency fixing the personal or property rights, privileges, immunities, duties or obligations of any person or group of persons . . .

Clearly, EMF studies, articles or journal reports in the Commission's possession are not public records and are not subject to the Commission's "Right to Know Law."

For the foregoing reasons, the Prosecutory Staff requests that Protestants' Motion to Compel Response of the PUC Prosecutory Staff to Request for Production of Documents be denied.

Respectfully submitted,



Patricia Krise Burket  
Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff  
Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

DATED: August 12, 1991

Annex A -

Objections of the Commission's Prosecutory  
Staff to Request for Production of  
Documents, dated May 31, 1991, filed July  
12, 1991

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

---

OBJECTION OF THE COMMISSION'S  
PROSECUTORY STAFF TO REQUEST FOR  
PRODUCTION OF DOCUMENTS DATED  
MAY 31, 1991

---

The Prosecutory Staff of the Pennsylvania Public Utility Commission pursuant to Section 5.342 of the Commission's Rules of Practice and Procedure, 52 Pa. Code §5.342, raises the following objections to the Request for Production of Documents dated May 31, 1991:

1. The Prosecutory Staff objects to Request for Production of Documents No. 1 as being overburdensome and overly broad, 52 Pa. Code §5.361. The request is for all EMF studies available to the Commission. The request has no end date and may be construed to include every study conducted on EMF since the beginning of time. Moreover, every study on EMF in any language which may be lodged in the files of the Library of Congress in Washington, D.C. is theoretically available to the Commission and to anyone else including PAUSE members. This is not information which is in the Commission's exclusive control and may be discoverable by PAUSE's counsel through his own efforts. The Prosecutory Staff does not

believe that it has the duty to engage the services of a research librarian to answer this overly broad production request.

Even if the request was limited to require production of only those EMF studies which were available within the Commission, thereby available to the Prosecutory Staff itself, the time and effort needed to ferret out every available EMF study from every Commissioner and staff member represents a Herculean task that cannot be described as anything less than overburdensome.

Finally, PAUSE has the burden in this proceeding to prove how the reconductoring of the old 138 kV line will adversely affect them. It is not the Prosecutory Staff's responsibility to aid PAUSE in making its case. Moreover, the identity of the EMF studies immediately available to the Commission or to Commission Staff is irrelevant to this proceeding and not reasonably calculated to lead to discoverable material, 52 Pa. Code §5.321(b). The issue of whether PAUSE members will be adversely affected by the reconductoring of this line will be decided on the record made in this proceeding.

2. Prosecutory Staff objects to Requests for Production of Documents Nos. 3 and 4 on the identical grounds -- that they are outside the scope of discovery, requesting information which is irrelevant to this proceeding. These requests concern Commission in-house EMF workshops. Request No. 3 requests transcripts or best compilation of data presented at seminars on EMF held between 1985 and 1991, and Request No. 4 requests all documents distributed by the Commission at these seminars.

The prior knowledge on EMF of the Prosecutory Staff, the Commission Staff or the Commissioners themselves is not relevant to this proceeding as the issue of whether PAUSE members will be adversely affected by reconductoring of the 138 kV line will be decided on the record generated before the administrative law judge.

Furthermore, provision to PAUSE of the various documents provided at the workshops amounts to the Prosecutory Staff providing technical research services to the counsel for PAUSE. The information on EMF presented at the seminars was compiled by the speakers from the available literature on EMF which is available to every other expert in the field. Furthermore, PAUSE members and their area representatives were invited to these seminars by the Commission and chose not to attend. They could have picked up this material then.

The Prosecutory Staff also objects to these requests under 52 Pa. Code §5.323 because they seek to discover the Prosecutory Staff's mental impressions, conclusions and opinions involving the EMF issue in this case. The Prosecutory Staff, who does not contemplate calling an expert witness at this time, is not required to divulge its personal knowledge of EMF studies acquired by attending these seminars to aid PAUSE counsel in preparing his expert witnesses for cross-examination by the Prosecutory Staff at hearing.

3. The Prosecutory Staff objects to Request for Production of Documents No. 5 as being vague, overly broad, overburdensome and outside the scope of this proceeding, 52 Pa. Code §5.321 and

\$5.361. This request is for production of all economic studies available to the Commission relating to "the costs of adjusting electrical facilities standards to deal with EMF, and/or the potential liabilities of not avoiding EMF exposure."

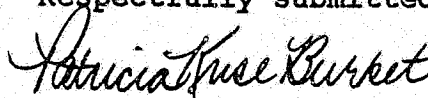
The request is vague and virtually unintelligible. There is no definition of "electrical facilities standards" nor of "potential liabilities of not avoiding EMF exposure" which might aid the Prosecutory Staff in identifying studies which might fall into this category of documents requested.

The request is also overly broad because it, like Request for Production of Documents No. 1, asks for all such studies available to the Commission, all of which would be also available to PAUSE through its own research. Again there is no end date given for this request.

The request is also overburdensome because of the effort and time which would be expended by the Prosecutory Staff in identifying, compiling and copying documents which arguably fall into the nebulous category requested given the protracted turnaround time for discovery requests discussed at the prehearing conference.

Moreover, this request is for documents which are outside the scope of this proceeding. The record was reopened in this case to allow PAUSE members to participate in a hearing solely on the issue of whether they would be adversely affected by reconductoring of this transmission line. The economic studies requested appear to involve EMF's financial impact on utilities and hence, would have no bearing on the potential effect of the line on PAUSE members, adverse or otherwise.

Respectfully submitted,



Patricia Krise Burket  
Assistant Counsel

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 12, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document on the parties listed below in the manner indicated in accordance with the requirements of 52 Pa. Code §1.54.

By First Class Mail and FAX

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

By First Class Mail

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Co.  
2301 Market Street  
Philadelphia, PA 19101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, NW  
Washington, DC 20004

ALJ Herbert Smolen  
Public Utility Commission  
1302 Philadelphia State Office Building  
Broad and Spring Garden Streets  
Philadelphia, PA 19130

*Patricia Krise Burket*

Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff for the  
Pennsylvania Public Utility  
Commission

P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 12, 1991

Annex B - Answers of the Prosecutory Staff to  
Request for Production of Documents, dated  
May 31, 1991, filed July 16, 1991



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17120

July 16, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

Jerry Rich, 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 Rich:

Enclosed for filing please find a Certificate of Service  
that on July 16, 1991, the Prosecutory Staff served upon counsel  
for Intervenors, and the other parties to the above captioned case,  
Answers of the Prosecutory Staff to Request for Production of  
Documents, dated May 31, 1991.

Sincerely,

Patricia Krise Burket  
Assistant Counsel

cc: All parties of record (w/enclosure)  
ALJ Smolen (w/o enclosure)



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P. O. BOX 3265, HARRISBURG, Pa. 17120

July 16, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

Robert J. Sugarman  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

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 Mr. Sugarman:

Enclosed are the responses of the Prosecutory Staff to  
the Request for Production of Documents filed on May 31, 1991.

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

Sincerely,

Patricia Krise Burket  
Assistant Counsel

Enclosure

cc: Jerry Rich  
(w/o enc.; w/cert.)  
Herbert S. Smolen, ALJ  
(w/o enc.; w/cert.)  
All parties of record  
(w/enc.; w/cert.)

1. All EMF studies available to the Commission.

Answer: An objection has been raised to this request.

2. Applicable safety standards for 238 kV transmission lines being constructed new in 1991.

Answer: The relevance of this request is questionable because the Woodbourne-Heaton line is being constructed to operate as a 230 kV line not a 238 kV line. However, the Prosecutory staff will answer this request. The current safety standards for all transmission lines are contained in the 1990 edition of the National Electrical Safety Code. The Woodbourne-Heaton 230 kV line is to be designed, constructed and maintained in accordance with these same safety standards. See Commission order entered February 9, 1990 at p. 3.

The 1990 edition of the National Electrical Safety Code is over 400 pages long, and is available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, N.J. 08855-1331. The Safety Code may also be available in public and university libraries.

3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985-1991.

Answer: An objection has been raised to this request.

4. All documents received and/or distributed by the Commission at EMF seminars, 1985-1991.

Answer: An objection has been raised to this request.

5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards to deal with EMF, and/or potential liabilities of not avoiding EMF exposure.

Answer: An objection has been raised to this request.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document on the parties listed below in the manner indicated:

By First Class Mail

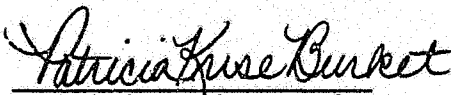
Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Co.  
2301 Market Street  
Philadelphia, PA 19101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, NW  
Washington, DC 20004

  
Patricia Krise Burket  
Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff for the  
Pennsylvania Public Utility  
Commission

P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 16, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code §1.54.

By First Class Mail

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

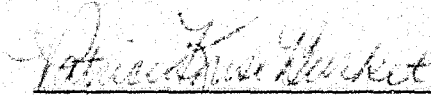
Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, N.W.  
Washington, DC 20004

Arundhati Khanwalkar, Esq.  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101



---

Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

DATED: August 12, 1991

# PHILADELPHIA ELECTRIC COMPANY

## LEGAL DEPARTMENT

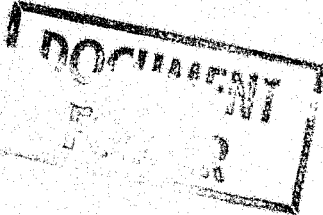
James W. Durham  
Senior Vice President  
and General Counsel

Eugene J. Bradley  
Of Counsel

Bjarnie R. Anderson  
Legal Administrator

2301 MARKET STREET, BOX 8699  
PHILADELPHIA, PA 19101  
(215) 841-5544 FAX: 568-3389

Donald Blanken  
Paul R. Bonney  
Ellen M. Cavanaugh  
Rudolph A. Chillemi  
Edward J. Cullen, Jr.  
Katherine K. Dodd  
Aubra S. Gaston  
Gregory Golazeski  
E. C. Kirk Hall  
Elizabeth P. Harris  
J. Lindsay Johnston  
Kimberly Lewis  
Stephanie Whitton Lewis  
T. Michael Mather  
Mary R. McFall  
Jenny P. Shulbank  
Assistant General Counsel



RECEIVED  
AUG 19 1991

August 14, 1991

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

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 Ms. McCloskey:

Enclosed are Philadelphia Electric Company's responses to  
the Office of Consumer Advocate's Interrogatories Set IV.

Sincerely,

*Paul R. Bonney*  
Paul R. Bonney

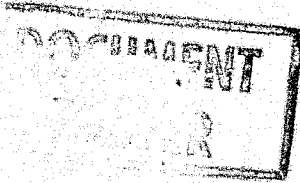
PRB/1ae  
Enclosure

cc: Jerry Rich, Secretary  
See Certificate of Service

WVLS

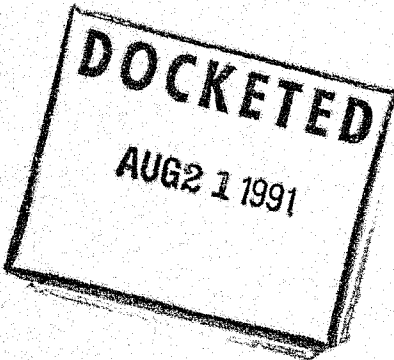
CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54.



By First Class Mail

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120  
(Response to Question No. 2 was Telecopied on  
August 13, 1991)



David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101  
(OCA Consultant)  
(Response to Question No. 2 was Telecopied on  
August 13, 1991)

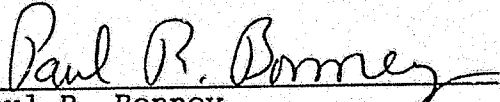
Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107  
(Counsel for Intervenors)

Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

(Continued)

Dr. Abraham Liboff  
Oakland University  
Department of Physics  
Rochester, MI 48309  
(Petitioners/Protestants Consultant)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA .19101

  
Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: August 14, 1991

APPEARANCE SHEET

ALJ HEARING REPORT

*pay*

DOCKET NO. A-110550F055  
 CASE NAME Notification of Philadelphia Electric Company, etc.  
 HEARING LOCATION Philadelphia, PA.  
 HEARING DATE August 15 ~~1991~~ 1991  
 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   
 Briefs to be filed YES  NO   
 BENCH DECISION YES  NO

**RECEIVED**  
 AUG 19 1991  
 Office of A. L. J.  
 Public Utility Commission  
**SECRETED**  
 SEP 11 1991

REMARKS:  PROCEDURAL SCHEDULE PREVIOUSLY ESTABLISHED

**DOCUMENT FOLDER**

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
 PLEASE PRINT CLEARLY  
 INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
TANYA J. McCloskey Telephone No. (717) 783-5048	1425 Strawberry Sq. City Hbg. State PA Zip 17120	Office of Consumer Advocate
Patricia Krise Burket Telephone No. (717) 783-2810	P.O. Box 3265 6-30, North Office Building City Hbg. State PA Zip 17105-3265	Commission Prosecutory Staff (Law Bureau)
Arundhati Khanwalkar Telephone No. (215) 774-4452	Two North Ninth Street City Allentown State Pa. Zip 18101	PPeL

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

*Robert J. Stovetter* (CRC Inv.)  
 Reporter

**SUGARMAN & ASSOCIATES**

ATTORNEYS AT LAW

16TH FLOOR, CITY PLACE

101 NORTH BROAD STREET

PHILADELPHIA, PENNSYLVANIA 19107

215-751-9733

FAX 215-751-9891

ROBERT J. SUGARMAN

ALAN M. KAPLAN

MARCIA E. BERRY

DAVID A. ROBERTS

LEGAL ASSISTANT

August 20, 1991

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

RECEIVED  
AUG 22 1991

SECRETARYS OFFICE  
Public Utility Commission

Re: Application No. A-110550 F.055

Dear Mr. Rich:

Please find enclosed for filing Protestants' Motion in the above matter.

Thank you for your consideration.

Sincerely,

  
Robert J. Sugarman

RJS:er  
Enclosures

cc: Tanya J. McCloskey, Esquire  
Patricia Krise Burket, Esquire  
Tinku Khanwalkar, Esquire  
Paul R. Bonney, Esquire

misc91.2\pause.ltr

NVL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

IN RE: LETTER OF NOTIFICATION : DOCKET NO. A-110550, F.055  
OF PHILADELPHIA ELECTRIC  
COMPANY UNDER 52 PA CODE  
§ 57.72(D) RE: PROPOSED 230 KV :  
WOODBOURNE TRANSMISSION LINE :

DOCKETED

AUG 27 1991

RECEIVED

AUG 22 1991

SECRETARY'S OFFICE  
Public Utility Commission

PROTESTANTS' MOTION TO DISMISS AND DENY APPLICATION,  
OR IN THE ALTERNATIVE, TO MOVE THE PROCEEDINGS  
TO ENCOMPASS ALL RELEVANT ISSUES

Affected property owners move that the Commission at this time deny the application or redefine the proceedings to encompass all relevant issues, and aver as the basis thereof the following:

1. After the Commonwealth Court declared the application to have been improperly approved, the Commission thereupon "reopened" the proceedings, but the Commission elected to instruct the parties and the administrative law judge to limit the issues, initially, to the issue of "effect."

2. As a result, as urged by the applicant Philadelphia Electric Company, the ALJ has thus far limited the proceedings to the issue of effect, and has precluded consideration of need.

3. As was clear at the first hearings on August 15, it is artificial to preclude the issue of need, while discussing alternatives, because need for the facility in question is a combined function of need for power and the elimination of other alternatives to the proposed facility, and rational decision making treats those questions in tandem, and not in isolation from each other.

4. Even PECO recognized that the issue of alternatives (which traverses into need) inevitably, is a part of the proceeding

at this time, by presenting testimony as to alternatives through its initial witness.

5. It is artificial, therefore, and wasteful, for the hearings to be foreclosed as to need.

6. Philadelphia Electric Company having conceded in its Pre-Hearing Memorandum that the issue of need would be appropriately reached once effect had been established through its witnesses' testimony at the August 15 hearing, has now acknowledged that the line will generate electromagnetic fields, which public policy, as implemented by the Company itself, requires be subject to prudent avoidance, in order to enhance the safety of the lines.

7. Despite the effort of the Company to have it both ways, by purporting to practice prudent avoidance, while contending that there is no conclusive evidence as to effect, the Company's actions and its employees' descriptions of those actions clearly demonstrate that the Company acknowledges the risk.

8. As a matter of scientific fact and law, as illustrated by PECO's brochure, the risk of injury constitutes an effect, in that prudent avoidance is required.

9. The Company acknowledged that it considered no alternatives which would avoid or minimize the risk, other than alternative designs within the predetermined right of way, although the right of way was acknowledged to be unusually narrow, and narrowness gives rise to more EMF.

10. Since the Company failed to identify, much less evaluate, any route alternatives, i.e., location, measures of prudent

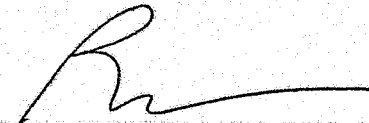
avoidance, the company's application is per se deficient, in that it fails to satisfy the regulations at 52 Pa. Code § 57.75(a)(2), to avoid unreasonable risk of danger to health and safety, and will have minimal adverse effect.

11. In addition, or in the alternative, since the Company has acknowledged effects, the issue of alternatives, including other means of delivering power to the customers, must be procedurally ripe, since testimony has established the adverse effect on petitioners, thus, under applicant's own argument, creating the appropriateness of the "needs" issue.

12. In light of the artificiality of the attempt to confine and bifurcate the "needs" versus "alternatives" questions, it is pointless and counterproductive to continue to maintain the distinction, now that the prerequisite to consideration of the needs issue has been satisfied.

13. It is clearly in the interest of the public, the protestants, and even the applicant, to conduct these proceedings in as expeditious a manner as possible, and unitary consideration will do so.

WHEREFORE, protestants pray that the ALJ will now enter a decision recommending dismissal or denial of the application, or, in the alternative, expand and broaden the issues as initially contemplated.



---

ROBERT J. SUGARMAN, ESQ.  
Counsel for Protestants

Of Counsel:

SUGARMAN & ASSOCIATES  
101 N. Broad Street  
Philadelphia, PA 19107  
(215) 751-9733

CERTIFICATE OF SERVICE

I hereby certify that I have caused a copy of the foregoing document to be served upon the following by first class mail this date:

Paul R. Bonney, Esquire  
Philadelphia Electric Company  
2301 Market Street, Box 8699  
Philadelphia, PA 19101

Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120



ROBERT J. SUGARMAN, ESQ.

8/20/91

# PHILADELPHIA ELECTRIC COMPANY

## LEGAL DEPARTMENT

James W. Durham  
Senior Vice President  
and General Counsel

Eugene J. Bradley  
Of Counsel

Bjarnie R. Anderson  
Legal Administrator

2301 MARKET STREET, BOX 8699  
PHILADELPHIA, PA 19101  
(215) 841-5544 FAX: 568-3389

Donald Blanken  
Paul R. Bonney  
Ellen M. Cavanaugh  
Rudolph A. Chillemi  
Edward J. Cullen, Jr.  
Katherine K. Dodd  
Aubra S. Gaston  
Gregory Golazeski  
E. C. Kirk Hall  
Elizabeth P. Harris  
J. Lindsay Johnston  
Kimberly Lewis  
Stephanie Whitton Lewis  
T. Michael Mather  
Mary R. McFall  
Jerry P. Shulbank  
Assistant General Counsel

August 21, 1991

RECEIVED

AUG 25 1991

SECRETARY  
F. J. ...

Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

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 Mr. Sugarman:

Enclosed is Philadelphia Electric Company's response to the  
On-The-Record Data Request of Intervenors at the August 15, 1991  
hearing.

Sincerely,

*Paul R. Bonney*  
Paul R. Bonney

PRB/lac  
Enclosure

cc: See Certificate of Service  
Jerry Rich, Secretary ✓

NVL

RECEIVED

AUG 25 1991

CERTIFICATE OF SERVICE

SECRETARY'S OFFICE  
PUBLIC UTILITY COMMISSION

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54.

By First Class Mail

Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107  
(Counsel for Intervenors)

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

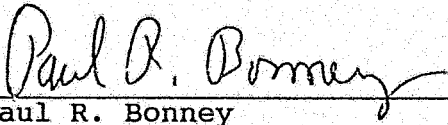
David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101  
(OCA Consultant)

AUG 27 1991

(Continued)

Dr. Abraham Liboff  
Oakland University  
Department of Physics  
Rochester, MI 48309  
(Petitioners/Protestants Consultant)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101

  
\_\_\_\_\_  
Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: August 21, 1991



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P. O. BOX 3265, HARRISBURG, Pa. 17120

ORIGINAL

August 29, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

Jerry Rich, Secretary  
Pennsylvania Public Utility Commission  
P. O. Box 3265  
Harrisburg, PA 17105

RECEIVED

AUG 29 1991

SECRETARY'S 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 Rich:

Enclosed please find an original and two copies of the Answer of the Prosecutory Staff to Protestants Motion to Dismiss and Deny PECO's Letter of Notification, or in the Alternative, to Expand the Scope of the Proceeding to Encompass All Relevant Issues. Copies of this answer have been served on all parties of record on this date as evidenced by the attached certificate of service.

Sincerely,

Patricia Krise Burket  
Assistant Counsel

Enclosure

cc: All parties  
ALJ Smolen



MVL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

RECEIVED

AUG 29 1991

SECRETARY'S OFFICE  
PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF	:	
PHILADELPHIA ELECTRIC COMPANY	:	
RELATIVE TO RECONSTRUCTING AND	:	Docket No.
REBUILDING OF THE EXISTING	:	A-110550, F.055
138 kV LINE TO OPERATE AS A	:	
WOODBOURNE-HEATON 230 kV LINE	:	

---

ANSWER OF PROSECUTORY STAFF TO  
PROTESTANTS' MOTION TO DISMISS AND DENY  
PECO'S LETTER OF NOTIFICATION, OR IN THE  
ALTERNATIVE, TO EXPAND THE SCOPE OF THE  
PROCEEDING TO ENCOMPASS ALL RELEVANT ISSUES

---

NOW comes the Prosecutory Staff who pursuant to 52 Pa. Code §5.103(a) files its Answer to Protestants' Motion to Dismiss and Deny PECO's Letter of Notification, or in the Alternative, to Expand the Scope of the Proceeding to Encompass All Relevant Issues (Answer). In support of its Answer the Prosecutory Staff states the following:

SEP 03 1991

MOTION TO EXPAND AND BROADER ISSUES

1. On August 20, 1991, the Protestants filed a Motion to Dismiss and Deny Application, or in the Alternatives, to Move the Proceedings to Encompass All Relevant Issues. In support of the portion of this motion dealing with broadening the scope of the proceedings, the Protestants alleged that the issue of "need" for the Woodbourne-Heaton 230 kV line is

intertwined with the issue of whether the Protestants would be affected by the line, and argue that the "need" issue should also be considered in this proceeding. The Protestants also alleged that Philadelphia Electric Company's (PECO's) presentation of testimony at the hearing on alternative designs that were considered for the line showed that PECO recognized that the "need" issue should also be considered at this hearing.

2. To eliminate all doubt about the purposes or the scope of this proceeding, the Prosecutory Staff reiterates its position as stated in its July 16, 1991 Prehearing Memorandum. Despite the Protestants assertion, the Commonwealth Court did not conclude that the Commission improperly approved PECO's letter of notification to reconduct or reconstruct an existing 138 kV line to operate as the Woodbourne-Heaton 230 kV Line. As stated in the Prosecutory Staff's Pre-hearing Memorandum at pp. 7-8:

Judge Palladino did not reverse or vacate the Commission's March 8, 1991 order which denied Protestants' Emergency Petition for Reopening,<sup>1/</sup> nor the Commission's February 9, 1990 order which granted PECO authority to construct the Woodbourne-Heaton line. Therefore, no legal reason exists why PECO would have to reprove every issue inherent in its letter of notification.

---

<sup>1/</sup> In fact Judge Palladino, sitting as a single judge on a preliminary matter, Protestants' Petition for Stay for construction of this line, did not have the power to reverse or vacate the Commission's May 8, 1991 order. Pa.R.A.P. §1561(a).

Judge Palladino ruled only that the Commission regulation, 52 Pa. Code §57.72(d), which requires notice of a proposed transmission line to entities owning property within the right-of-way, was insufficient to notify neighboring property owners [Protestants]. She then prescribed a remedy to cure the insufficient notice -- that the Commission hold a hearing on one issue within 90 days of the date of her order. That one issue is whether the Protestants would be adversely affected by the reconstruction of the line. If Protestants or OCA were disturbed or disappointed by the scope of the hearing which was set by Judge Palladino's May 24, 1991 order and was granted by the Commission's June 14, 1991 order, they could have appealed these orders. Since the Protestants and OCA did not appeal, they cannot now before the ALJ seek to expand the scope of the hearing by argument.

3. Moreover, as was also stated in the Prosecutory Staff's Prehearing Memorandum at p. 6:

Judge Palladino's May 24, 1991 order and the Commission order entered June 14, 1991 made it clear that this hearing on remand was to be confined to one issue and one issue only -- whether Protestants would be adversely affected by the reconductoring and reconstruction by PECO of the former Conrail electric line on the railroad right-of-way.

The limitation of the scope of this hearing to one issue has precedence. Past Commission orders have similarly limited reopening of the record in various proceedings to reconsider one issue. Pa.P.U.C. v. General Telephone Company of Pa., 57 Pa.PUC 765 (1983); Skyline Motor Aircargo, Inc. et al. v. Amram Enterprises, Ltd., 57 Pa.PUC 579 (1983).

4. That PECO presented testimony at the hearing on alternative line designs does not indicate that PECO necessarily believes that "need" is inextricably intertwined

with safety concerns (effect). The most damaging inference that logically and reasonably can be drawn from PECO's presenting this testimony is that it was seeking to comply with the Administrative Law Judge's July 18, 1991 pre-hearing order which determined, pursuant to Commissioner Joseph Rhodes' request, that prudent avoidance would be considered in this proceeding (Order entered July 18, 1991, p. 5).

5. "Need" is an altogether separate issue from safety, or as the Protestants have dubbed it "effect"<sup>2/</sup>. To further disagree with the Protestants, rational decision making requires resolution of the "need" issue first, and then consideration and selection of the project design to meet the need. Afterall, if a project is not "needed", there is no reason to design the project, or for that matter, to consider alternative designs for a project.

6. In the instant case, "need" for the Woodbourne-Heaton 230 kV line was established by PECO and was determined by the Commission in its February 9, 1990 order:

However, the high load growth [in the area] has also precipitated some potential electrical problems. A case in point is the new Linton substation which is to be supplied by the Buckingham-Woodbourne 230 kV line, a radial line emanating from Buckingham substation. Unlike Woodbourne,

---

<sup>2/</sup> The Prosecutory Staff does not pretend to know exactly what the Protestants mean by the term "effect", but for the sake of this argument will assume that the term stems from the supposed adverse effects which the line will allegedly have on the Protestants.

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 9, 1990 at A-110550, F.055, p. 2.

Additional testimony on need for PECO's Woodbourne-Heaton line is not required, is not necessary or is not appropriate in this proceeding.

7. Moreover, it is not in the public interest nor in PECO's interest to relitigate an issue which has been conclusively proven and determined by the Commission. Relitigation of this issue would do nothing but delay the timely completion of this expedited proceeding.

MOTION TO DENY

8. In the portion of the Protestants' Motion in which the Protestants request that PECO's original letter of notification be dismissed or denied, they allege that PECO, in presenting testimony that prudent avoidance was utilized in designing the Woodbourne-Heaton transmission line to enhance its safety, admitted that electromagnetic fields (EMF) presented a safety hazard. Moreover, the Protestants also allege that because PECO did not evaluate any alternative routes for the line, PECO's letter of notification was per se deficient vis-a-vis Commission regulations. The Prosecutory Staff will address these arguments in order.

9. In their motion, the Protestants contend that "[a]s a matter of scientific fact and law, as illustrated by PECO's brochure, the risk of injury constitutes an effect, in that prudent avoidance is required." Motion, p. 2, para. 8. The Prosecutory Staff believes that PECO's brochure, which was entered into the record as Protestants' Exhibit No. 1 speaks for itself, but it does not say what the Protestants wish it did say.

If there is a health risk, how great is it?

Apparently it is very small. For instance, if EMFs are found to be linked to leukemia in children, the chances of developing the disease are increased from one in 20,000 children to 2.5 in 20,000. For all of us, there are far greater cancer-causing concerns: e.g. smoking, improper diet, chemical exposure, too much exposure to sun, family history and high stress level.

Protestant's Exhibit No. 1, p. 1.

10. Moreover, the Protestants' implied, but unstated tautology -- "if it is necessary to practice prudent avoidance, there must be a risk" -- is not consistent with the underlying basis for "prudent avoidance." "Prudent avoidance", a term coined by Dr. M. Granger Morgan from Carnegie-Mellon University in Pittsburgh, in the context of managing electromagnetic fields (EMF) from transmission lines, is the strategy of making minimal cost modifications in the design and siting of transmission lines that will help reduce EMF exposure to the public. According to Dr. Morgan's publication "Electric and Magnetic Fields from 60 Hertz Electric Power: What do we know about possible health risks?" (Attachment A), prudent avoidance is properly exercised when there is some basis for concern, but no definite establishment of a risk:

What can be done? What should be done?

First, continue and expand research, focusing especially on issues of human health so we can have some clear answers. Almost everyone who has thought carefully about the issues of 60 HZ fields agrees that this is needed.

\* \* \*

Second . . . well, here things get difficult. It would be nice if we could spell out clear conclusions about actions. We can't. The reason is that science is not complete enough today to support such conclusions. Anything more we can say will go beyond science and involve judgments and values.

Basically there are three approaches available:

1. Conclude there is not yet enough evidence to warrant any action.
- \* \* \*
2. Conclude that there is some basis for concern. Adopt a position of "prudent avoidance," which means limiting exposures which can be avoided with small investments of money and effort. Don't do anything drastic or expensive until research provides a clearer picture of whether there is any risk and, if there is, how big it is.
3. Conclude we have a real problem and spend some time and money on an aggressive program of limiting field exposures now, while recognizing that we may eventually learn that some or all of this effort and money has been wasted either because it wasn't needed.

"Electric and Magnetic Fields", p. 24, emphasis added.

From the above passage, it should be clear that the application of prudent avoidance is not the recommended approach in the face of a "real problem", i.e. an established risk. PECO's voluntarily following a program of "prudent avoidance" in designing its lines, or referencing the concept in one of its public relations brochure does not translate into an admission on PECO's part that EMF is an established safety risk. Therefore, Protestants' Motion to Dismiss or Deny PECO's letter of Notification is without support, and should be denied.

10. Even if it can be argued that the act of PECO's applying "prudent avoidance" in designing the Woodbourne-Heaton

line evidences PECO's acknowledgment that there is some concern about the EMF issue, the existence of a concern is not enough to deny PECO's letter of notification. Under 52 Pa. Code §52 Pa. Code §57.76(a)(2), the line must pose an unreasonable risk of danger to the health and safety of the public before the line can be disapproved. Because the record does not contain any evidence to support the Protestants' allegation that EMF is an established public health and safety risk it cannot be concluded that the Woodbourne-Heaton line would pose an unreasonable risk of danger. Therefore, the Protestants' motion to dismiss should be denied.

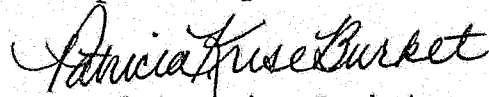
11. Protestants also claim that it was not enough for PECO to evaluate alternate designs for the line, but that PECO had to do more. Protestants claim that because PECO did not consider alternate routes other than the Conrail right-of-way it purchased for the line, PECO's letter of notification is per se deficient, and should be denied. Motion, p. 3, para. 10. There are two reasons that this argument is wrong. First, the Commission's regulations or policy do not require PECO or any other electric utility to apply prudent avoidance in siting or designing transmission lines. PECO's decision to apply prudent avoidance in the design of the Woodbourne-Heaton line was voluntary, and PECO should not be faulted to apply the strategy as fully as the Protestants may have wished. Second, Commission regulations require an electric utility to submit alternate routes only

when it files an application for transmission line siting, but not when it files a letter of notification. See 52 Pa. Code §57.72(d)(4). Because PECO was merely reconstructing an old Conrail electric line, approval for which could be obtained by use of the letter of notification procedure, PECO did not need to present alternate routes for the line to the Commission. Therefore, PECO's letter of notification is not per se deficient because of its failure to do so.

CONCLUSION

For the foregoing reasons, the Prosecutory Staff requests that Protestants' Motion to Dismiss and Deny PECO's Letter of Notification, or in the Alternative, to Expand the Scope of the Proceeding to Encompass All Relevant Issues be denied.

Respectfully submitted,



Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff

Public Utility Commission  
Room G-30  
North Office Building  
P. O. Box 3265  
Harrisburg, PA 17105-3265

Dated: August 29, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the following parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code §1.54:

By First Class Mail

Robert J. Sugarman, Esq.  
Sugarman & Associates, Esq.  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

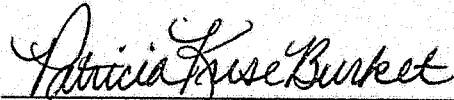
Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004

Tinku Kahnwalkar, Esq.  
Pennsylvania Power & Light Company  
Two North Ninth Street  
Allentown, PA 19101



---

Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

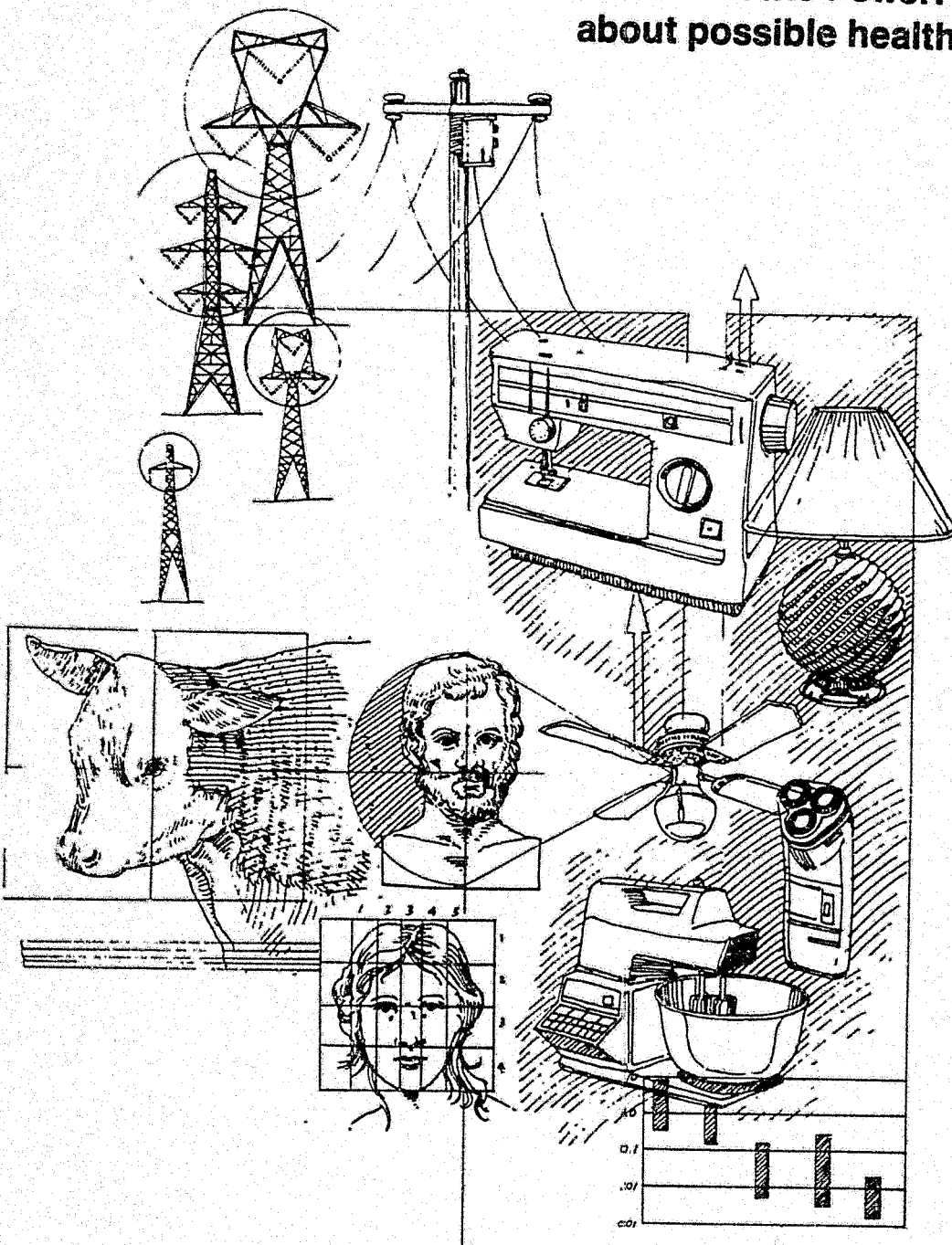
Pennsylvania Public Utility Commission  
P. O. Box 3265  
Harrisburg, PA 17105

Dated: August 29, 1991

ATTACHMENT A

Dr. M. Granger Morgan, "Electric and  
Magnetic Fields from 60 Hertz Electric Power:  
What do we know about possible health risks?",  
Department of Engineering and Public Policy  
Carnegie Mellon University, Pittsburgh, PA 15213  
(1989)

# Electric and Magnetic Fields from 60 Hertz Electric Power: What do we know about possible health risks?



Department of Engineering and Public Policy  
Carnegie Mellon University  
Pittsburgh, PA 15213

## Table of Contents

What are 60 hertz electric and magnetic fields?	1-10
Do 60 hertz fields pose significant health risks?	10-21
Are weaker fields safer than stronger fields?	21-23
With all the uncertainty, what can we do?	24-31
Do 60 hertz fields from power lines pose significant risks to farm crops and animals?	34-36
Who wrote this brochure?	37-38
Summary of this brochure	39
Glossary	40
Appendix: How to learn more	43

This brochure was written by Prof. M. Granger Morgan who is Head of the Department of Engineering and Public Policy and a Professor of Electrical and Computer Engineering at Carnegie Mellon University. He was assisted in the preparation of the brochure by Ms. Connie Cortes, Ms. Wendy Davis, Prof. Baruch Fischhoff, Dr. Keith Florig, Mr. Gordon Hester, Prof. Jim Hoburg, Prof. Lester Lavo, Dr. Indira Nair and Dr. Emilie Roth, all of Carnegie Mellon University, and by Dr. Paul Slovic and Dr. Don MacGregor of Decision Research (Eugene, Oregon). While the author and his associates are solely responsible for the contents of this brochure, thanks are due to the following for assistance with reviews: Dr. Anita Curran, Mr. Jack Lee, Prof. Kai Lee, Mr. Hamilton Owen, Prof. Gilbert Omenn, Mr. Jack Sahl, Prof. David Savitz, Dr. Asher Sheppard, Dr. Maria A. Stuchly, Prof. Oia Svenson, Mr. Richard Tell, Ms. Susan White, Ms. Susan Wiltshire, Dr. Nancy Wertheimer, and several dozen non-expert concerned citizens. The drawings in the brochure were done by Frederick H. Carlson.

Research on possible risks from exposure to 60 Hz electric and magnetic fields and the problems of communicating about these risks has been supported at Carnegie Mellon University by the United States Department of Energy, the Electric Power Research Institute (EPRI) and the National Science Foundation (NSF).

Preparation of this brochure was supported by grant SES-8715564 from the National Science Foundation. Production costs were supported by EPRI contract number RP 2955-3. Neither NSF nor EPRI reviewed, approved, or has any responsibility for the contents of this brochure.

Copyright 1989. (Eighth Printing)

This material may be reproduced for free distribution. It may not be reproduced for sale in any form without the written permission of the author.

Department of Engineering and Public Policy  
Carnegie Mellon University  
Pittsburgh, PA 15213

## **What is the point of this brochure?**

There are electric and magnetic fields wherever there is electric power. This means there are fields associated with big and small power lines, wiring in homes and places of work, and all electrical appliances. Increasingly scientists, regulators and lay people are asking whether human exposure to these fields involves risks to health or the environment. A lot of good scientific research has now been done. However, because the biological effects of fields are complicated and still not fully understood, answers to simple questions about whether there are risks are not straightforward. This brochure discusses in non-technical language what is known, what is still not known, and things that might be done about this potential risk. We have tried very hard to be balanced in our treatment, but we have not avoided expressing judgments or opinions when we think that is necessary. The brochure is long, and sometimes a little complicated, because the subject is complicated.

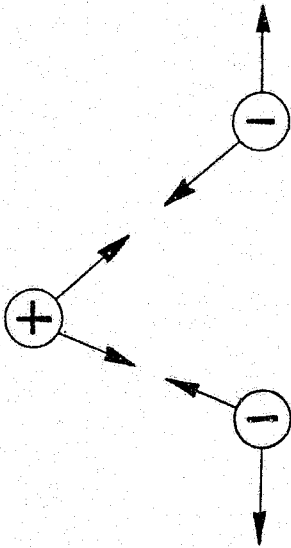
## **Why is it called 60 hertz electric power?**

The electric power that we use in our homes, offices and factories uses AC, or alternating current. This is in contrast to the DC, or direct current, that is produced by batteries. An alternating current does not flow steadily in one direction. It alternates back and forth. The power we use in North America alternates back and forth 60 times each second. Scientists call this 60 hertz (Hz) power. In Europe and some other parts of the world the frequency of electric power is 50 Hz rather than 60 Hz.

## **What are 60 Hz electric and magnetic fields?**

They are fields associated with 60 Hz power. These fields are created by electric charges. Charges produce two kinds of fields; *electric fields* which result just from the strength of the charge and *magnetic fields* which result from the motion of the charge. Taken together these are often referred to as electromagnetic fields.

Electric fields represent the forces that electric charges exert on other charges at a distance *because they are charged*. You may recall from school that charges with



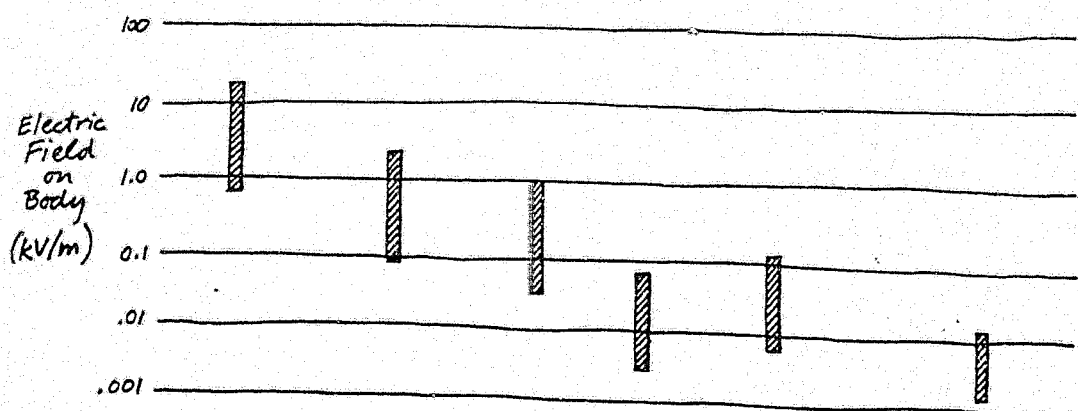
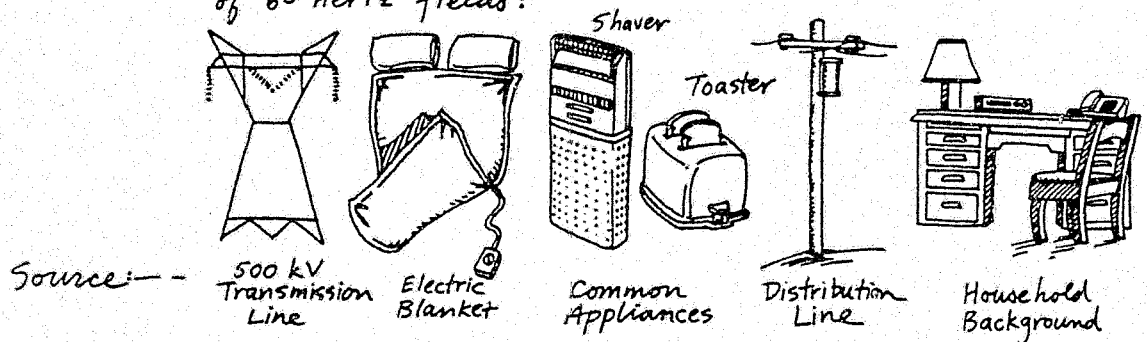
the same sign (two positive charges for example) repel each other. Dissimilar charges (a positive and a negative charge) attract each other. These forces of attraction or repulsion are carried from charge to charge through space by the electric field.

When charges move they create additional forces on each other. These additional forces are carried through space by magnetic fields. A magnetic field represents the forces that a moving charge exerts on other moving charges *because they are moving*. A group of charges all moving in roughly the same direction is called an electric current. All currents produce magnetic fields.

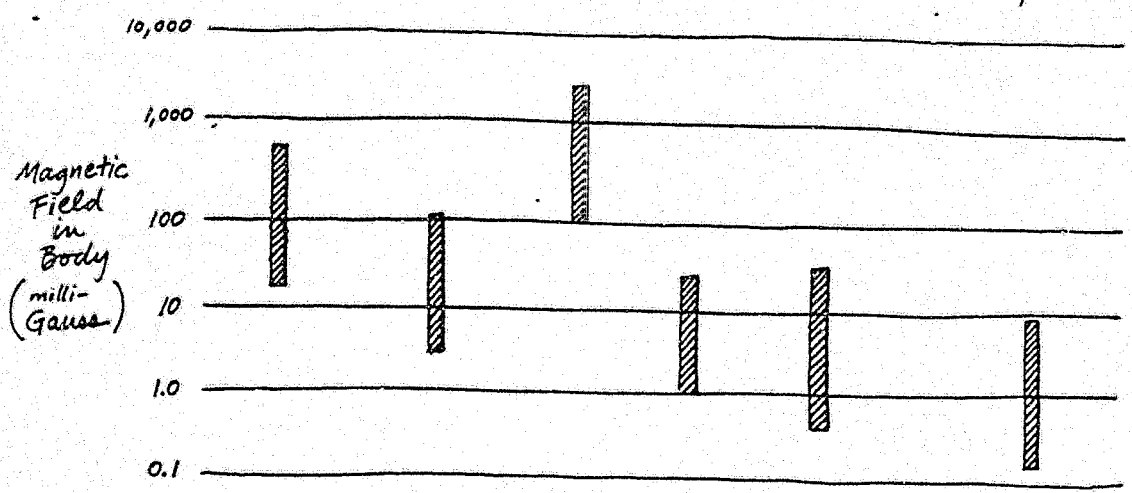
Electric fields begin on positive charges and end on negative charges. Magnetic fields form closed continuous loops around currents. Everything that has an electric charge has fields associated with it. Hence, electric and magnetic fields are found throughout nature and in all living things. The magnetic field of the earth, which makes a compass needle point north, is made by flowing charges, or currents, in the earth's molten interior. The molecules in our bodies and in all other living and non-living things are held together by fields. The messages that flow in our nervous systems involve fields. When you get a shock from static electricity by touching someone on a rug on a dry winter day, the spark is caused by strong electric fields from the many charges you have picked up from the rug (in more humid weather these charges from the rug leak off, so they don't build up as much).

Fields may be steady (DC) or they may change their strength and direction regularly in time (AC). Sixty Hz electric power involves charges which move in currents that have a frequency of 60 Hz. Thus, *all* 60 Hz power produces electric and magnetic fields that change their strength and direction with a frequency of 60 Hz. For example, wiring and appliances in the home and office produce such fields. Because 60 Hz power is so widely used in our modern society, there are 60 Hz electric and magnetic fields almost everywhere we go.

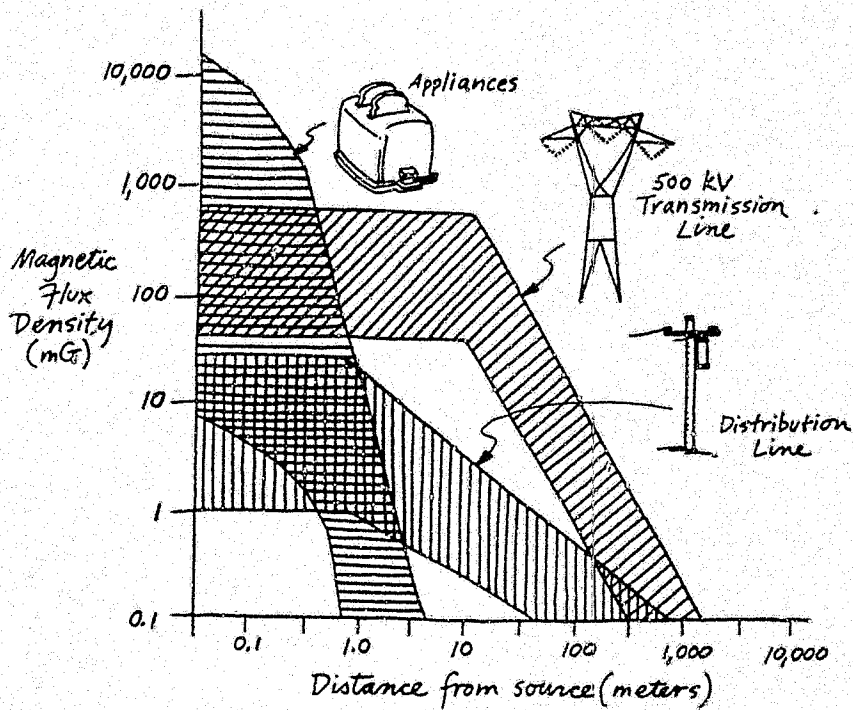
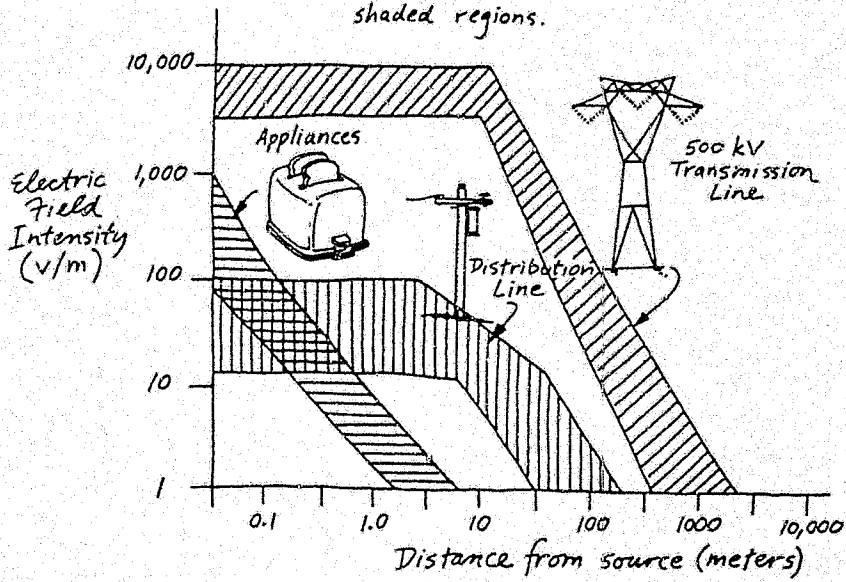
Approximate strength of the average electric field at the surface of the body produced by several common sources of 60 hertz fields:



Approximate strength of the average magnetic field produced within the body by several common sources of 60 Hertz fields:



The strength of the electric or magnetic field at different distances from power lines and appliances lies somewhere in these shaded regions.



## **Do fields get weaker as you move away from electrical objects?**

Yes, the strengths of electric and magnetic fields diminish as you move away from electrical objects just as the light from a candle grows dimmer as you move away from it or the heat from a campfire falls off with greater distance. The drawing to the left shows roughly how the strengths of fields decrease with distance from transmission lines, distribution lines, and household appliances. The different patterns result from the different electrical properties of the objects.

## **What else affects the strength of a field?**

The strength of an electric field depends on the voltage of the object creating it. For example, a high voltage power line usually produces stronger electric fields than a low voltage power line. Current does not have to be flowing in the object for an electric field to exist. Thus, a toaster or an electric blanket that is plugged in, but not operating, may still produce an electric field.

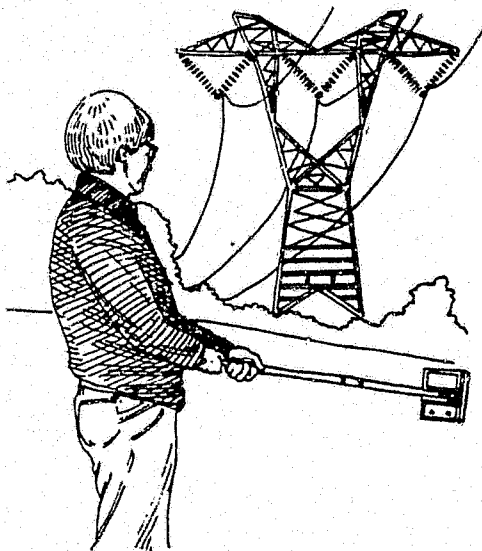
Currents produce magnetic fields. Stronger currents produce stronger fields. For example, the magnetic field generated by a hair dryer will be higher when the dryer is operated on its "high heat" setting (when it draws lots of current) than when it is operated on its "low heat" setting (when it draws much less current). However the electric field from the dryer will be about the same in both cases since the electric field comes from the amount of charge (voltage), not from the movement of charge (current). Since magnetic fields are created only when current is flowing, appliances which are plugged in but turned off do not produce magnetic fields.

Fields and currents that occur at the same place can interact to add or subtract. Thus the strength of the electric and magnetic fields associated with objects like power lines, wiring, and appliances depends upon things such as the location of the object, the location of other near-by objects, and the electrical conditions of use. Some details are provided in the box on the next page.

## More Details About 60 Hertz (Hz) Electric And Magnetic Fields.

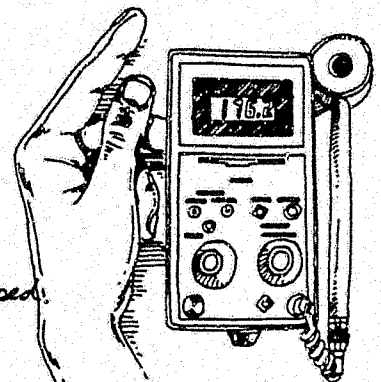
### How are fields measured?

The strength of 60 Hz electric and magnetic fields can be measured with special instruments. The words used in describing measurements of field strength sound technical, but the basic ideas are no more complicated than measuring weight in pounds or distance in miles. The strength of an electric field is measured in units of volts per meter, abbreviated V/m. When the field is strong, larger units of a thousand volts per meter or "kilo" volts per meter are used. This is abbreviated as kV/m. Several different units are commonly used to report the strength of magnetic fields. The two most common units are the gauss and the tesla. Like gallons and ounces or miles and feet, gauss and tesla are just different units for measuring the same thing. The gauss is a fairly large unit so magnetic field strength is often reported in thousandths of a gauss or "milli" gauss (abbreviated mG). There are 10,000 gauss in one tesla. In this brochure we will use gauss.



*Electric fields are commonly measured with a field meter like the one shown at left. Since the human body is a conductor which can distort the field, the meter is held on a large insulating stick in order to get a measurement of the "unperturbed" electric field.*

*Magnetic fields are usually measured with a simple coil and a meter such as those shown to the right. Since the presence of the human body does not distort the magnetic field, the meter can simply be held in the hand. Recently, miniaturized field instruments have been developed. These instruments are small enough to be easily carried around in a pocket, or even worn like a watch.*



A number of electric utility companies now own field measuring instruments and are willing to send trained technicians to make measurements in homes or other locations for concerned customers. There are also a number of engineering consulting firms that make measurements as a commercial service. Your local utility should be able to identify the ones nearest to you. Before you go to any significant effort to get measurements made, ask yourself what you will do with the information once you have gotten it.

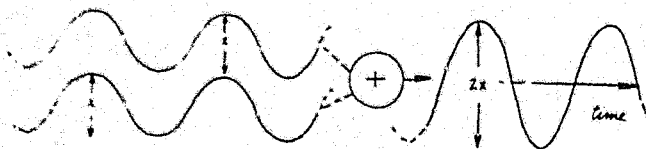
### Can the strength of fields be calculated or does it have to be measured?

In simple situations, like a transmission line crossing an open field, field strengths can be calculated very accurately using formulas from physics and electrical engineering. Such calculations are often done in designing or approving transmission lines. In more complex settings it may be harder to compute the fields because of the complex shapes of some of the objects involved, or because the patterns of currents and voltages are complex. In these cases, it may be easier just to measure the field rather than to try to calculate it.

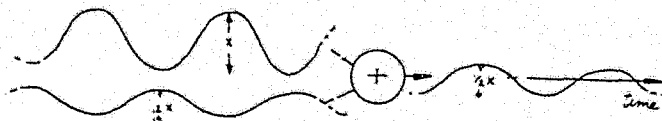
### Can fields add together or cancel each other out?

Yes. Fields can add to and subtract from each other. Suppose we have set up two separate 60 Hz electric fields at the same place in space. Each has a strength of 4 V/m (volts per meter) and they are exactly in phase, that is, they are alternating in strength and direction *together* at 60 Hz. If we measure the field we will measure 8 V/m. The two 4 V/m electric fields have added. On the other hand, if the two fields are exactly out of phase, that is if one reaches its greatest strength in one direction exactly when the other reaches its greatest strength in the reverse direction, we will measure a field of 0 V/m, because the two fields will cancel. This same kind of adding and subtracting also works for magnetic fields.

*Combining two 60 Hertz fields that go up and down together (in phase) results in a stronger field:*



*Combining two 60 Hertz fields that go up and down oppositely (out of phase) results in a weaker field:*



## **Details About Fields...continued.**

### **Can 60 Hz fields make currents flow in objects or change their voltage?**

Yes. Sixty Hz electric and magnetic fields move charges in conducting objects (including our bodies). This makes currents flow. Such redistribution of charges can also change the voltage of an object. Strong fields "induce" stronger changes than weak fields.

If you touch a conducting object that carries an induced voltage, a "contact current" will flow. If it is large enough you will get a shock. Contact currents from most electrical devices, such as refrigerators or other appliances, are usually too small to feel. Occasionally, they are large enough to be noticeable. For example, a high enough voltage might be induced on a long ungrounded fence wire that runs parallel to a high voltage transmission line to give someone an electrical shock. Similarly, a large rubber-tired farm vehicle parked under a transmission line might give an operator a shock when he first touches it. There are safety regulations which control the field strengths of transmission lines to limit such "induction effects" in order to guard against injury or accidents. Responsible utilities also take steps to correct unsafe situations along their high voltage transmission lines and to inform people who work and live along such lines about safe practices.

Our bodies are conducting. Hence, whenever we are in a 60 Hz field, currents will flow in our bodies because of induction. The patterns of current flow induced by electric and magnetic fields are different. In the case of electric fields, the size of the current also depends on whether and how the body is grounded. Except when we are in very strong fields, the currents that are directly induced are typically small when compared with the contact currents we get when we touch large appliances such as a refrigerator.

Magnetic fields pass through most common objects without being significantly affected. Electric fields are affected by objects, especially objects that can conduct electricity. Some of the field lines can end on charges in the object. For example, things like trees or a garden gazebo can partially block or shield out electric fields from a power line. Normal houses can also partially shield electric fields. The amount of shielding varies somewhat with construction material. A typical house shields about 90% of the electric field from outside. If such a house is next to a power line that makes an electric field of

1 kV/m<sup>1</sup> just outside the house, the electric field inside the house will be only about 10% as large or about 100 V/m. The fraction of the electric field that a house blocks can be increased with the proper use of shielding materials such as grounded aluminum roofing and siding.

### Are 60 Hz fields like X-rays or microwaves?

Not really, although they are all forms of electromagnetic energy. X-rays (and other forms of "ionizing radiation" such as gamma rays) produce effects in living systems because the energy carried by the X-rays is so large that it can break molecular bonds. It can actually break apart DNA, the molecules that make the genes. This is the way X-ray exposure can lead to cancer. However, the energy carried in 60 Hz fields is *much* too small to break molecular or chemical bonds.

Microwaves do not carry enough energy to break chemical or molecular bonds but they are absorbed by the water in tissue where they can also set up strong currents. This causes heating. This heat is what makes a microwave oven work.<sup>2</sup> If a person like a maintenance worker gets right in front of a very powerful microwave antenna, such as some of those used for radar or communication, significant health damage can result from heating body tissue. There are safety standards designed to protect people from such exposure.

While 60 Hz fields can also set up currents in tissue, these currents are much weaker. The amount of heat they generate is trivial compared to the natural heat that comes from the cells of the body. There is no reason to believe that health effects can be caused by such minuscule amounts of heat.

For many years some scientists and engineers argued

---

<sup>1</sup> kV/m = 1000 volts/meter. (See the question "How are fields measured?" in the box on page 6 for a discussion of the units in which electric and magnetic fields are measured.)

<sup>2</sup>Modern microwave ovens are designed to keep all the microwaves inside. As soon as the oven turns off, the currents in the food stop. So, once the food is taken out of the oven it is just like any other cooked food. It has not "picked up" any radiation.

that because 60 Hz fields cannot break molecular or chemical bonds and cannot produce significant heat in the body they could not possibly produce significant biological changes or effects. As we explain below, this argument has turned out to be incorrect because there are other ways in which fields can interact with individual cells to produce biological changes. Whether these changes can lead to health risks remains unclear.

### **Do 60 Hz fields pose health risks?**

The honest answer is that nobody knows for sure. Scientists have found that fields can produce a variety of biological effects, like changes in the levels of specific chemicals the body makes and changes in the functioning of individual nerve cells and the nervous system. Whether any of these changes can lead to health risks is less clear. We discuss many of the specifics in the sections that follow.

Scientists have also studied the statistics on death and disease for people who are exposed to fields in their normal course of living and work. Such studies are termed "epidemiological studies." Some of them suggest that there may be an association<sup>3</sup> between field exposure and certain forms of cancer. Other similar studies show no such association. The evidence is not conclusive.

Some careful responsible scientists examine all the scientific evidence and remain unconvinced that there are any significant health risks from 60 Hz fields. Others, equally careful and responsible, look at the same evidence and conclude that there may be risks.

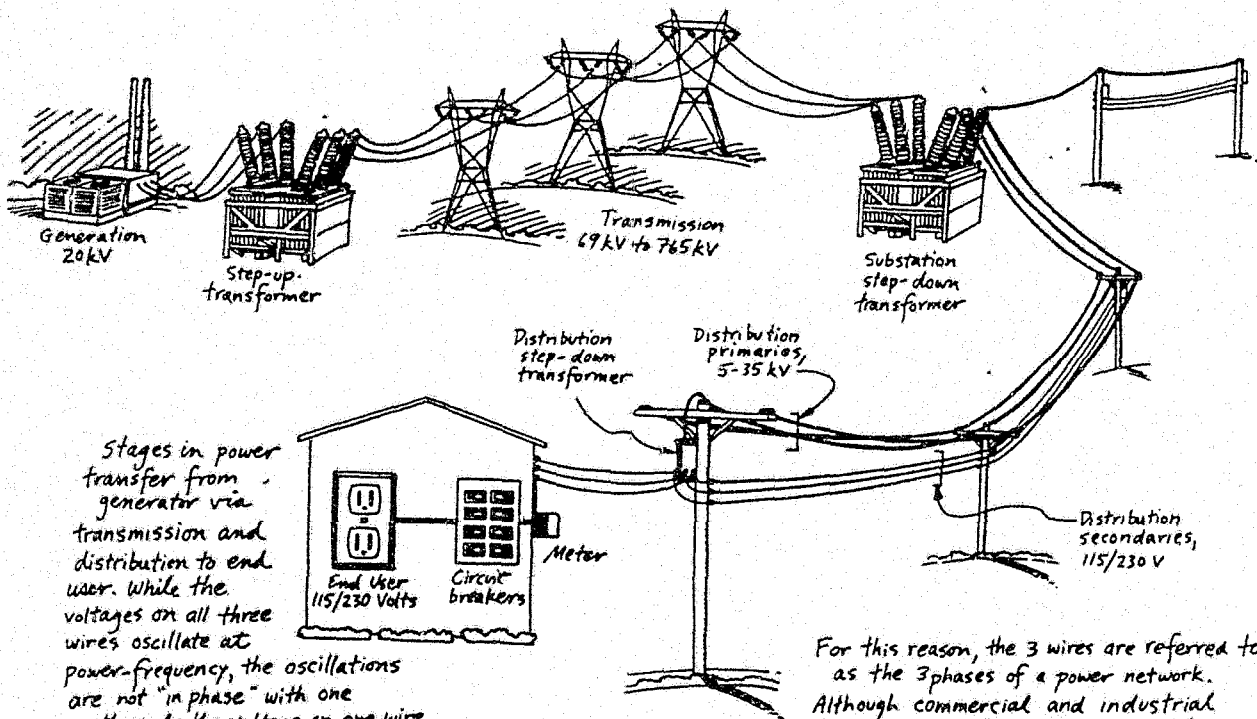
---

<sup>3</sup>In epidemiology the word "association" is not a synonym for "causes" or for "contributes to." It means that statistically the things occur together but not necessarily that one causes the other. A more complete discussion of this point occurs on page 17.

## The electric power system.

Electric power is produced by large generating plants and then transferred to homes, businesses, and factories by a transmission and distribution system. Transmission lines use very high voltages and go long distances. Distribution lines consist of primaries which operate at intermediate voltages and serve a region and secondaries which bring power to individual homes. Transmission lines, and many distribution lines, use three "hot" wires. While the voltages on all three wires oscillate at 60 Hz, the oscillations are not "in phase" with one another. As the voltage on one wire is peaking, the voltage on one of the others is one-third of a cycle ahead and the voltage on the remaining wire is one-third of a cycle behind.

For this reason, the three wires are referred to as the three phases of a power network. Although commercial and industrial facilities use three-phase power to run large motors and other heavy loads, the 115V power in homes is generally supplied by just a single phase. Utility companies try to connect equal numbers of houses to each phase of a residential distribution network in order to balance the load across the phases. Throughout the system there are circuit breakers (not shown in the drawings) which will automatically disconnect if a short circuit or other safety problem occurs.

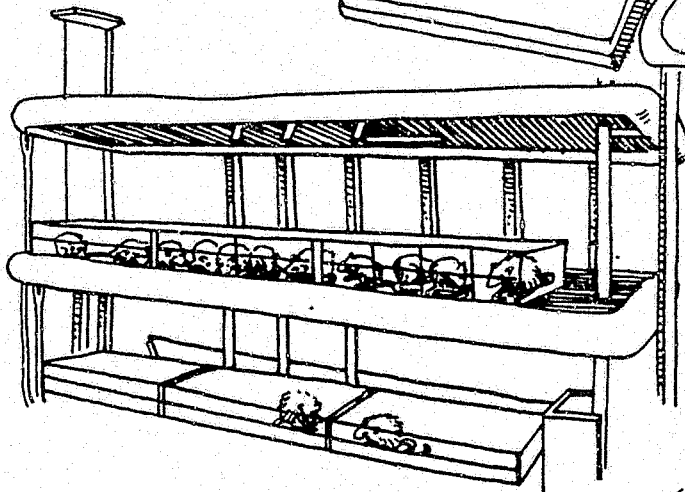
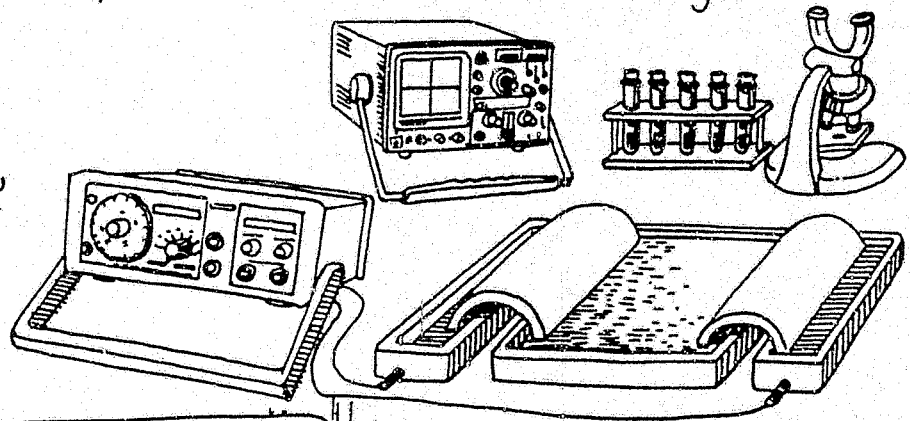


Stages in power transfer from generator via transmission and distribution to end user. While the voltages on all three wires oscillate at power frequency, the oscillations are not "in phase" with one another. As the voltage on one wire is peaking, the voltage on one of the others is  $\frac{1}{3}$  of a cycle ahead and the voltage on the remaining wire is  $\frac{1}{3}$  of a cycle behind.

For this reason, the 3 wires are referred to as the 3 phases of a power network. Although commercial and industrial facilities use 3-phase power to run large motors and other heavy loads, the 115V power in homes is generally supplied by just a single phase. Utility companies try to connect equal numbers of houses to each phase of a residential distribution network in order to balance the load across the phases.

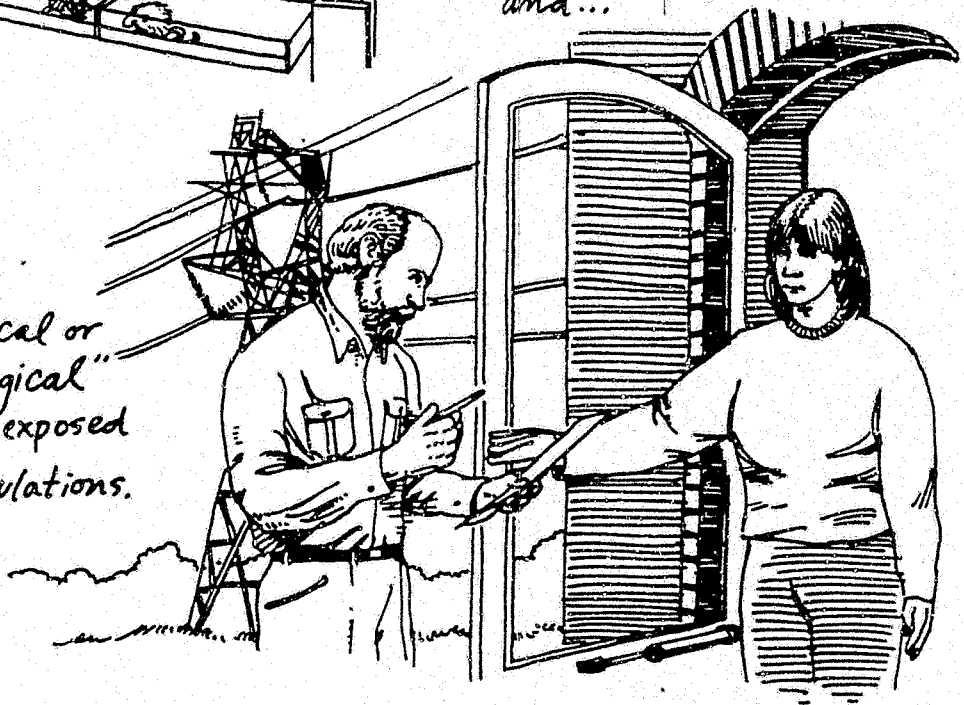
Scientific evidence about possible health effects from exposure to 60 hertz electric and magnetic fields is obtained in several ways:

In experiments using single cells, groups of cells, or organs....



... in experiments that expose whole animals such as rats or mice and...

... in statistical or "epidemiological" studies of exposed human populations.



The disagreements result because the available scientific evidence is complex. Current knowledge is fragmentary and insufficient to explain everything that is observed. Responsible scientists can have legitimate disagreements about how the available evidence should be interpreted. Until more scientific studies are done, these disagreements will remain and simple yes or no answers to questions about possible health risks will not be possible.

As with many controversial technical problems, there are a handful of "experts" who are less careful and responsible than they should be. They are the source of the confident but contradictory statements you may have heard which make it sound like the experts are completely confused. These people complicate life because in addition to having to come to grips with a very complicated subject, lay people and public officials have to identify and sort out these biased experts from the majority who are careful and responsible.

### **What kinds of studies of possible biological effects from 60 Hz fields have been done?**

Basically three kinds of studies have been done: 1) laboratory studies that expose single cells, groups of cells, or organs to fields under a variety of conditions and look for effects; 2) laboratory studies that expose animals or humans to fields and look for effects in body function, chemistry, disease, or behavior; and 3) epidemiological studies of various human populations which look for an association between exposure to 60 Hz fields and various diseases.

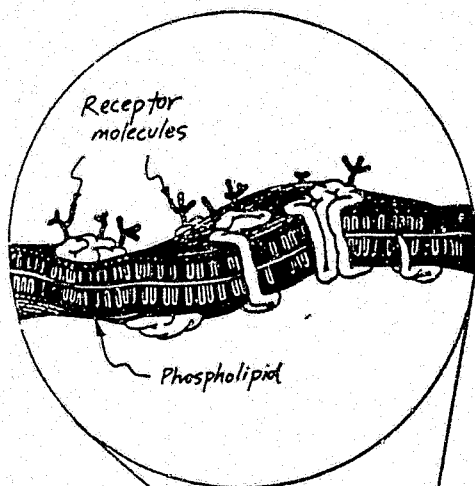
### **You said that 60 Hz fields can have some biological effects. Just what do you mean by that?**

There are two basic kinds of effects that have been observed. Strong electric fields can stimulate the skin of animals, by vibrating hairs or by triggering various sensors in the skin. If a person stands in an electric field of

more than about 20 kV/m he or she is likely to feel a slight tingling sensation. There have been a variety of studies which indicate that animals can also feel strong electric fields. People cannot sense the presence of magnetic fields.<sup>4</sup> While these "perception" effects are interesting, and have received quite a lot of research attention, few people ever spend time in fields that are strong enough to be felt.

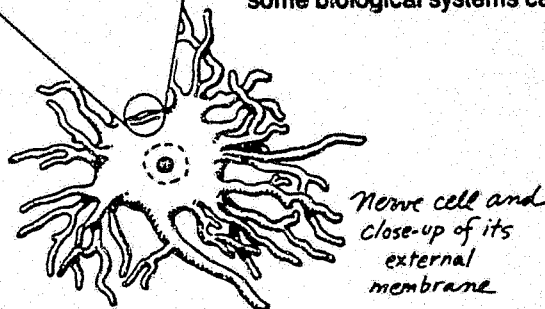
Potentially more important results come from experiments which show that under certain circumstances fields can interact with the surfaces of cells and trigger changes inside these cells. Modern biology tells us that the surface of the cell is made up of a double layer of "phospholipid" molecules, similar to a double-layered soap bubble. In this "bi-layer" float various large complex molecules which act as receptors to communicate between the cell and its surroundings and to serve as channels that can move selected material into and out of the cell.

While the details remain unclear, a variety of experiments have shown that fields, even fairly weak fields, can interact with the cell surface, or with some of the receptor molecules in that surface, and produce changes in how the cell operates. The fields contain very little energy. In some way the cell surface or its receptors act as an amplifier to send a signal into the cell that can change things like the rate at which the cell makes hormones, enzymes and other proteins. These chemicals play roles in the operation of the cell and in signaling to other cells and tissues.



---

<sup>4</sup>There are exceptions. People can sometimes sense the presence of extraordinarily strong magnetic fields because these fields cause flashes of light in the eye. However, fields this strong are found only in laboratories and other special situations. Some animals have developed special exquisitely sensitive sense organs that can sense the presence of very weak electric or magnetic fields. These organs are used in navigation and in looking for prey. While they are very special, the existence of these organs makes it clear that at least some biological systems can be affected by very weak fields.



## **What kinds of specific findings have been reported from the laboratory studies?**

While a number of biological effects have now been observed, they haven't been easy to find. Early studies of fields exposed large numbers of rats, mice and other animals, as well as various individual cells to see if anything happened. Most of these "screening studies" didn't find any differences between animals or tissues exposed to fields and those not exposed to fields. The few studies that did find interesting changes have been followed up with more detailed experiments. Effects that have been reported include: changes in the production of various chemical messengers, including chemicals like melatonin that are important in daily biological cycles called circadian rhythms, and chemicals called neurotransmitters which send signals between nerves; changes in the rate at which the genetic material DNA is made and in the rate of errors when RNA is copied from it; changes in the amount of calcium found inside or on the surface of cells; and changes in the rate of growth and cell division of some cells. While all of these effects may prove significant for our eventual understanding of how fields affect cells, it is important to understand that some of the experiments involve conditions that are very different from those that occur when people are exposed to fields.

Most studies have used individual cells or animals, but there have also been a few which have used people. Studies of people exposed to fairly strong fields in special exposure rooms have reported effects on heart rate and on reaction time. There is some indication that some people respond more than others. Some of the effects appear to be more pronounced when the fields are turned on and off repeatedly rather than left on continuously. Studies which have sent weak currents through volunteers with electrodes attached to their skin report no observed effects after exposures of several hours. Studies of people sleeping with electric blankets report changes in the level of the hormone melatonin.

All these different effects or biological changes are interesting. However, it is not clear if they have significant implications for people's health.

If you would like to look at some detailed reviews of the health effects literature you can find an introductory guide to reviews of that literature in the Appendix at the end of this brochure.

### **What about the studies of cancer?**

There have been two kinds of "epidemiological" studies which have looked for an association between exposure to 60 Hz fields and cancer. The first set of studies has looked at the death rates from different diseases for people who are employed in "electrically related" occupations and compared them with the death rates from the same diseases for all other people. The second has compared the magnetic field exposures received by people with specific cancers, especially leukemia, with the exposures received by other similar people who did not have cancer. Most of these latter studies have involved exposure at home from power distribution lines (lines on the big poles in the street). The cancer that has been studied the most is childhood leukemia.

Some of these studies of both kinds have found a statistical association between increases in field exposure and increased cancer rates. As we discuss on the next page in an example involving roosters and sunrise, the phrase "statistical association" is not a synonym for "causes" or for "contributes to." Depending on the study and the type of cancer, the incidence of cancer in exposed populations may be up to two to three times higher than that experienced by unexposed or less exposed populations.<sup>5</sup> Most of these cancers are fairly rare, for example childhood leukemia affects about one in every 14,000 children per year or about 1 in 1,100 per lifetime. A two-fold increase would raise the incidence to one in 7,000 per year or 1 in 550 per lifetime.

Many investigators believe that if they play some role,

---

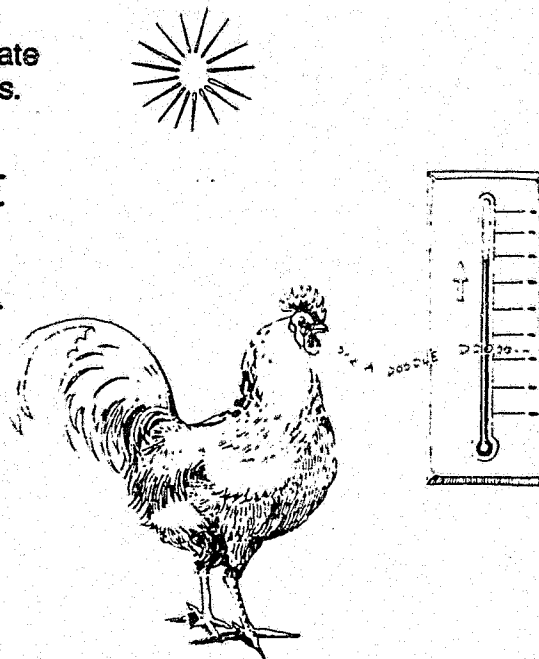
<sup>5</sup>In contrast, cigarette smoking increases the risk of lung cancer by 20 to 60 times.

fields alone will not turn out to cause cancer (i.e, fields will not be an "initiator"). Rather they are more likely to work together with one or more other environmental factors (i.e., fields will be a "promoter").

All of the epidemiological studies involve some level of statistical uncertainty. The results are summarized in the figure on the next page with bars that show "confidence intervals." Studies in which the confidence interval includes the result "no change in the rate of cancer incidence" are generally referred to as negative studies. The others are generally referred to as positive studies.

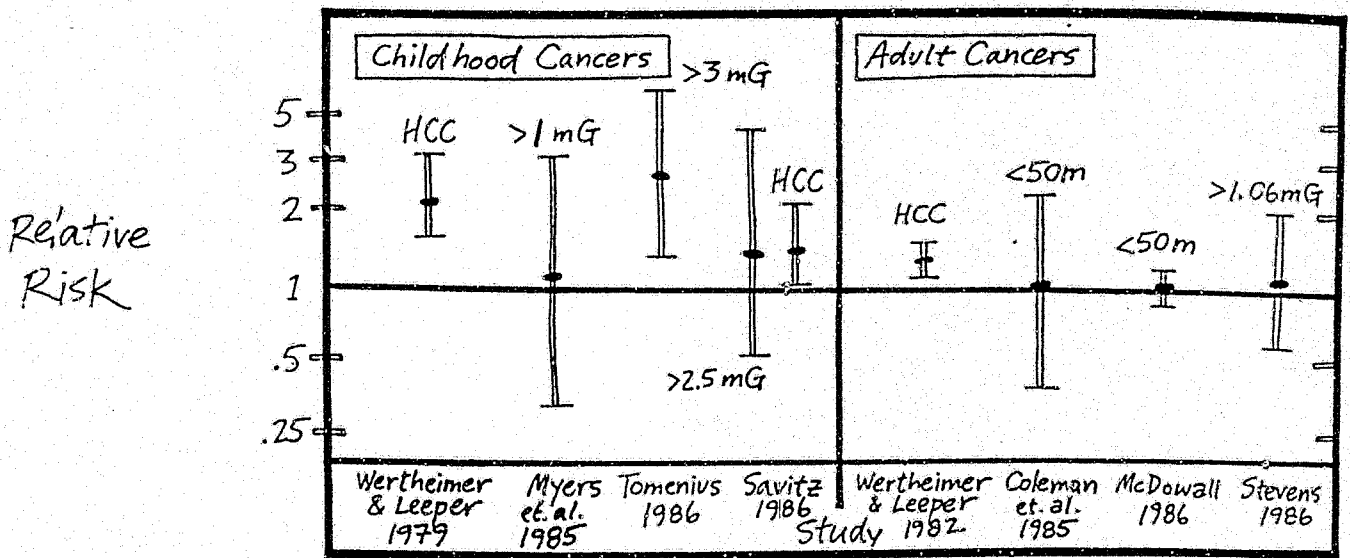
The two most widely discussed positive studies involve childhood leukemia. Both were conducted in the Denver, Colorado, area, the first by Nancy Wertheimer and Ed Leeper, the second by David Savitz and several colleagues. Both these two studies, which involve different groups of children, report an increase in the incidence of childhood leukemia in homes close to heavy duty distribution lines—the big wires found on the tops of many large poles in the street. Other studies demonstrate that these lines typically produce strong magnetic fields.

It is important to remember that the positive epidemiological studies show a statistical association. They cannot prove that fields are involved in causing cancer. For an illustration of a statistical association that does not show causation, consider the fact that roosters crow every morning and on most mornings a little while after the rooster crows the temperature rises. A statistical study would show a correlation between roosters crowing and rising temperatures. In this case we know that the sunrise causes both of these phenomena. Despite the statistical association, the crowing rooster is not causing the temperature to rise!



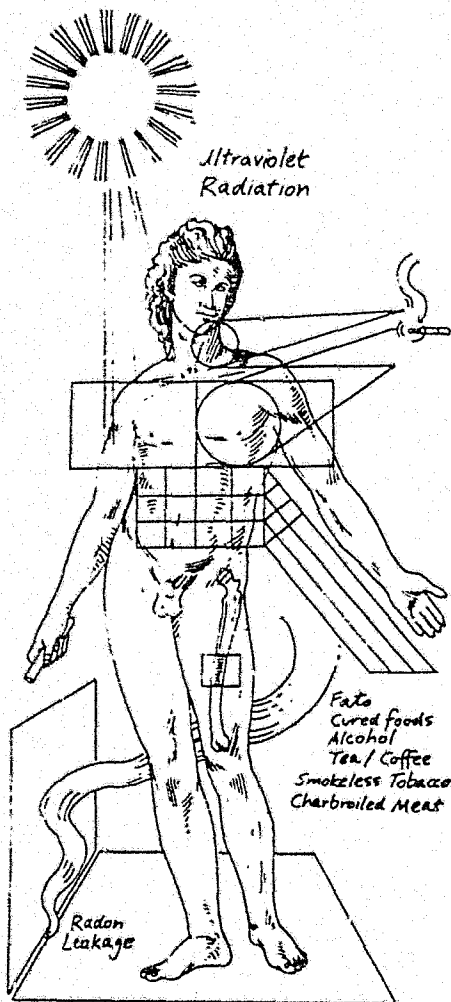
*The statistical association between a rooster crowing in the morning and the usual rising temperature does not mean that the rooster causes the temperature to rise.*

There is great controversy about whether the various epidemiological studies show any true relation between field exposure and cancer. Some careful responsible scientists argue that they do. Other responsible scientists point to a variety of very real problems in the design and interpretation of these studies. They argue that the reported findings may be the result of statistical problems or that the cancers may come from various other causes. For example, most of the occupational studies have not "controlled" for other important known carcinogens such as smoking and chemicals in the work place. The number of people exposed to the strongest fields in the Denver studies is small. This increases the chance that the results are due to coincidence rather than to a real association between field exposure and cancer. Such uncertainty, and the resulting debate about the meaning of data, are fairly common occurrences in epidemiological studies. Resolution of these issues will require more and better data. Additional epidemiological studies are now in progress. However, in the past when epidemiological studies have succeeded in clearly identifying a hazard (e.g., cigarettes or asbestos) the risks



Results from a number of epidemiological studies of cancer risk for persons exposed to magnetic fields from power lines near their homes. The vertical scale shows the ratio of the number of cancer cases among groups exposed to stronger fields to the number of cases among groups exposed to weaker fields. A relative risk of one means "no change in the cancer incidence rate." The vertical lines indicate the statistical uncertainty that results from the relatively small number of people in each study. HCC — high current configuration, < 50 m — persons living within 50 meters of a transmission line or substation, mG — milligauss. Adapted from Ahlbom et al., 1987.

## How can I reduce my risk of cancer?



Later in this brochure (pp. 25-28) we discuss a few prudent steps people might take to limit some of their exposure to 60 Hz fields. But fields may not turn out to have anything to do with cancer. If you are concerned about cancer risks, be careful to keep things in perspective. Remember that there are a number of steps you can take which will almost certainly have a greater impact on reducing your cancer risk than anything you might do involving fields. Cigarettes are the leading contributor to cancer today by a very large margin. People who stop smoking, even after many years, greatly lower their cancer risk. Smokers who aren't concerned about their own health but are worried about their children or other family members, should also stop. Associations between smoking and health impacts on non-smokers in the home have been established. This evidence is significantly stronger than that for fields and cancers. While most lung cancer comes from smoking, perhaps as much as 20% results from exposure to radon, a colorless, odorless, naturally occurring radioactive gas found in all buildings. You can check your home for radon with a simple test kit. If the level measured is more than the EPA action limit of 4 picocuries per liter of air, contact a qualified contractor to discuss ways in which the concentration can be reduced by increasing ventilation and sealing cracks in the basement.

Beyond smoking, diet is probably the most important factor in cancer. Current evidence suggests that for most people the basic make-up of their diet is much more important

than possible food additives or contamination by toxic materials. Things to *reduce* include: fats; charbroiled meat; smoked, cured and pickled foods (things like salami); pepper; celery; mushrooms; alcohol; smokeless tobacco products; and perhaps tea and coffee. On the other hand things to *increase* include the amount of fiber; fresh fruits and selected vegetables, especially raw cabbage, broccoli and cauliflower; and foods that are rich in vitamins A, C and E. Finally there is sunlight. While light is essential to well being, strong direct sunlight, especially at mid-day in the summer, is a leading contributor to skin cancer. If you are concerned about your risk of cancer you should try to avoid exposing your skin to strong sunlight and use an effective sun screen when you can not avoid exposure.

If you would like to learn more about the causes of cancer we suggest you get the very readable book by Leslie Roberts titled *Cancer Today: Origins, prevention and treatment*, National Academy Press, 1984 (address: 2101 Constitution Avenue, NW, Washington D.C., 20418). A second very useful book is *Cancer Rates and Risks*, published by the U.S. Department of Health and Human Services, NIH Publication 85-691, 1985. (Available through the U.S. Superintendent of Documents, Washington, D.C., 20402).

have involved increases of more than tenfold. If fields present a risk of cancer, but the increase in risk is something like two or three, epidemiology may never be able to resolve the uncertainty. For this, large expensive animal studies may be necessary.

You can find references to more detailed introductions to some of the epidemiological literature in the Appendix at the back of this brochure.

### **Suppose 60 Hz field exposure does promote cancer. How serious could the problem be?**

There are just under half a million deaths each year from cancers of all kinds in the United States. Cancers account for roughly a quarter of all deaths. Cancer deaths occurred in significant numbers well before 60 Hz fields became a common feature of everyday life. Their number has not shown any dramatic increase as the country has electrified. Hence, it seems unlikely that fields could be a major contributor to cancer today. However, with the evidence now available we cannot rule out the possibility that 60 Hz fields are a significant factor in cancer risks. Frustrating as the uncertainty may be, we also cannot rule out the possibility that fields have *nothing to do* with cancer.

### **Besides cancer, are there other health effects of possible concern?**

Research on cancer has received most of the attention. However, work has also been done to explore the possibility of birth defects using mice, rats and small pigs. The mouse and rat studies showed no convincing evidence of birth defects from exposure to fields. Results in the pig study are more ambiguous and are complicated by several problems in the way the experiment was designed and conducted.

A large study, recently completed in several laboratories, exposed chicken eggs to short pulses of magnetic fields that repeated at 100 times per second (100 Hz). The pulses used turned on rapidly. This study observed a larger fraction of defects in exposed eggs than in eggs that were not exposed to fields. Because the fields were very different from 60 Hz fields and the defects were not found in all the laboratories, the implications of these results for 60 Hz field exposure are not clear. There are many electronic products like video displays, TVs, speed controllers and dimmer switches which produce low frequency pulsed fields which turn on rapidly, so these results cannot be ignored.

Scientists are now conducting a large study of the possible effects of electric blankets on human pregnancies. Earlier studies of this issue have been suggestive but have involved too few women to allow reliable conclusions.

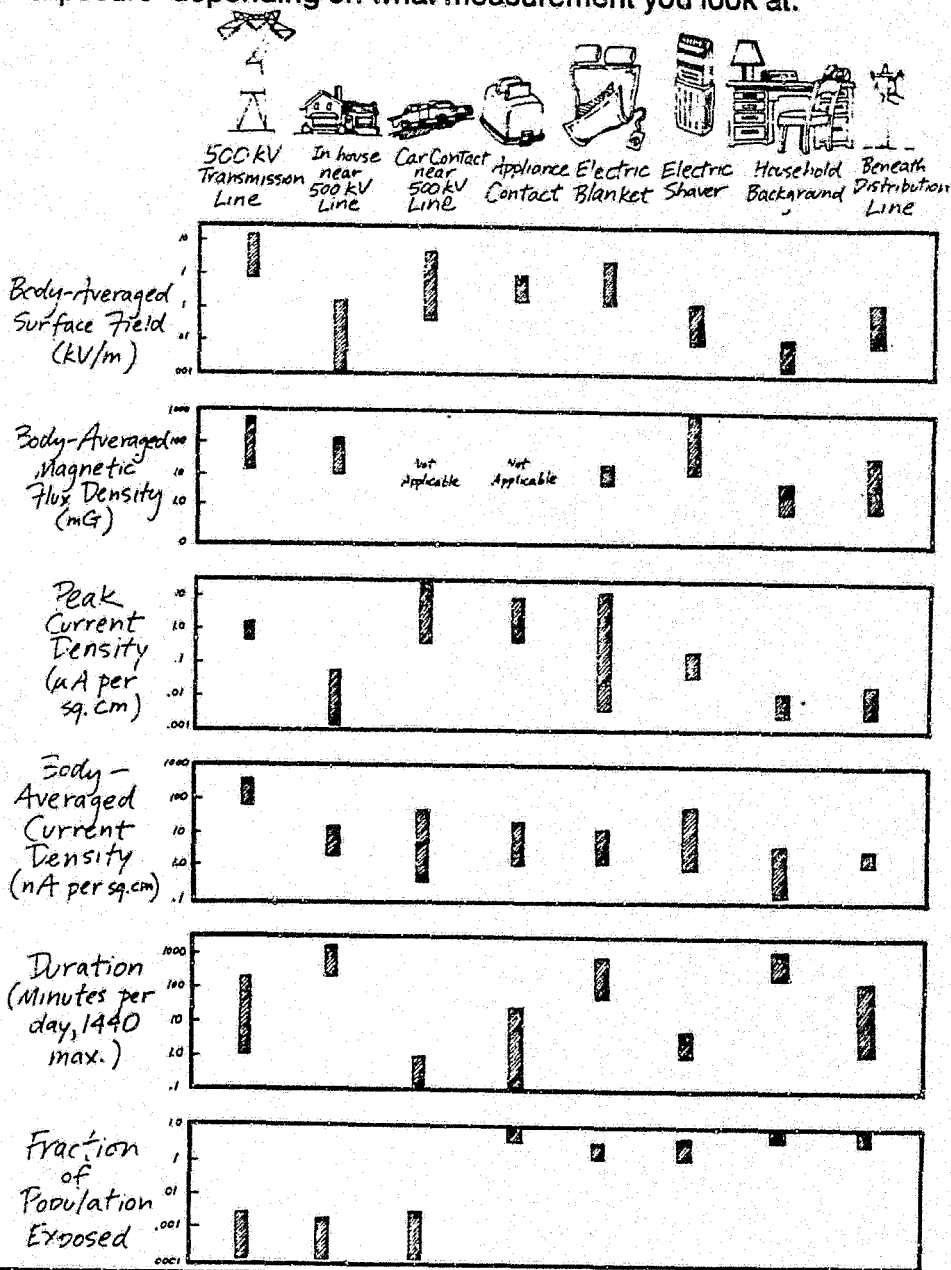
Some animal studies suggest 60 Hz fields may interact with the system that runs the body's biological clock (circadian rhythm) or with the nervous system. There is some reason to think that field exposure might be involved in chronic depression or other systemic neurological disorders. However, there is so little evidence about these effects that, at this point, such arguments are really just speculation.

### **If there is a risk, are weaker fields safer than stronger fields?**

Experience with hazards like air and water pollution lead most people to answer yes. But we must be careful. If we are talking about *very weak* versus *very strong* fields the answer probably is yes. But suppose we are talking about smaller differences. For example, if fields pose any risk, is an electric field of 50 V/m safer than a field of 200 V/m? Is a magnetic field of 3 milli-Gauss safer than a magnetic field of 10 milli-Gauss? We do not know. Some people use the epidemiological evidence to argue yes. But there are also reasons to believe the answer could be no. If fields do pose a risk, at these levels of

## What is dose?

We do not know what aspect of fields (if any) is important in determining human risks from exposure to 60 Hz fields. It could be the average peak field strength; it could be the peak field strength; it could be the average or the peak current which the fields set up in the body; it could be a variety of other things like time spent in the field, or number of times you pass into or out of the field. The problem is that since we do not know which is the right measure we have difficulty saying which source of exposure gives people the greatest "dose." The word "dose" means exposure that produces effects. As the figure below shows, you get different answers to the question "which source of fields produces the biggest exposure" depending on what measurement you look at.



exposure, weaker fields may not be safer than stronger fields. In short: *more may not be worse*. This is a hard point to understand because *more is worse* for most pollutants. More is worse for chemicals in drinking water, or for air pollution. How could this simple rule not hold for 60 Hz electric and magnetic fields?

The reasons for doubt come mainly from the laboratory experimental studies. Some of these studies show very complex relations between exposure patterns and effects. For example there are experiments that show "resonant" processes. That is, effects appear for fields with some frequencies and field strengths (amplitudes) and not others. A simple way to understand this is to think of a yo-yo. A yo-yo is a "resonant system." To make it go you must move your hand up and down at the right times (that is at the right frequency) with just the right amount of distance (the right amplitude). If you do use the right frequency and amplitude, the yo-yo works. If you don't, the yo-yo doesn't work. Some of the processes by which fields interact with the surfaces of cells appear to have these same "resonant" characteristics. Thus, for example there are experiments that show no effect with a strong field but, when the field strength is reduced a little bit the effect appears. In at least some of these experiments it appears that the frequencies and amplitudes at which the resonant responses occur depend upon the strength of the DC (i.e. steady) magnetic field that is present.

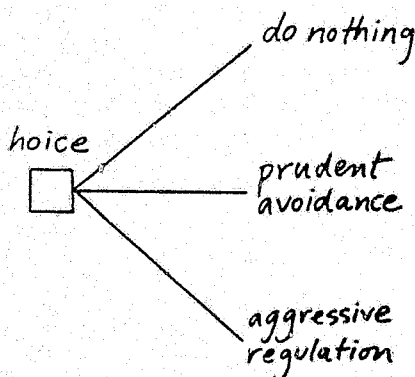
There are other experiments in which biological effects are seen only after being in the field for a very long time. In other cases, effects appear above a certain field strength but then show no additional changes as field strength increases further. Some effects appear only for the first few moments in the field. Others are seen only with pulsed fields that have special pulse shapes. It will be some time before scientists can sort out all this complicated evidence and explain it. In the meantime, it seems wise not to assume that weaker fields are necessarily safer than stronger fields, at least across the range of commonly experienced fields.

## What can be done? What should be done?

First, continue and expand the research, focusing especially on issues of human health, so that we can have some clear answers. Almost everyone who has thought carefully about the issues of 60 Hz fields agrees that this is needed. Unfortunately, many of the busy decision makers who control the resources that are needed for this support have not thought as much about this issue as they need to. They need to be better informed.

Second...well, here things get difficult. It would be nice if we could spell out a few clear conclusions about actions. We can't. The reason is that the science is not complete enough today to support such conclusions. Anything more we say will go beyond science and involve judgments and values. Basically there are three approaches available:

1. Conclude that there is not yet enough evidence to warrant any action. Don't make any changes in the way we do things until new research tells us clearly whether there is a risk and, if so, how big it is.
2. Conclude that there is some basis for concern. Adopt a position of "prudent avoidance," which means limiting exposures which can be avoided with small investments of money and effort. Don't do anything drastic or expensive until research provides a clearer picture of whether there is any risk and, if there is, how big it is.
3. Conclude we have a real problem and spend some serious time and money on an aggressive program of limiting field exposures *now*, while recognizing that we may eventually learn that some or all of this effort and money has been wasted, either because it wasn't needed or we spent it the wrong way because we didn't understand the science well enough to spend it effectively.



In the three questions that follow we discuss the pros and cons of each of these possible conclusions.

### **Can we justify doing nothing?**

Some people answer yes. They argue that doing nothing is the right response given the scientific ambiguity that exists today.

Whether we should do nothing, exercise "prudent avoidance," or take more dramatic action is not a scientific question. It is a matter of making a value judgment. Individuals and state regulators have to look at the available evidence. They must also consider the attitude they want to take toward risk. Then they must make a judgment about whether they find the evidence sufficiently troubling to warrant taking action and spending resources that might be spent on other things. Different attitudes toward risk can lead to different actions even among people who agree about the evidence. Some people have concluded that the current scientific ambiguities about possible health effects from fields are so large that no action is justified at this stage. They argue that we should limit our safety efforts and expenditures to *demonstrated* hazards where we can really be sure we are getting some benefits for our efforts.

### **What are the arguments for "prudent avoidance"? Why do you use the word prudent?**

If exposure to fields involves risks, we'd like to be able to set some safety standards. We'd like to be able to say which field conditions are safe and which are not and should be avoided. If you have read the earlier discussion you've learned that the available scientific knowledge won't allow us to do this.

But suppose an individual or a regulator is concerned, thinks the evidence points toward the possibility of some risk, and feels that something should be done. In this case, they can try to exercise some prudence by keep-

ing people out of fields when this can be done with modest amounts of money and trouble. However, in circumstances where the cost and problems associated with doing anything would be large, these people would argue that the prudent thing to do is wait until better information is available.

In our private lives we exercise prudence all the time when we face an uncertain risk. In public decision making we have more trouble being "prudent" about uncertainty. Public risk management activities tend to treat things as either dangerous or safe, with no middle ground. It may take some guts for a regulator to adopt a "prudent avoidance" strategy.

Prudence means "exercising sound judgment in practical matters." It means being "cautious, sensible, not rash in conduct." How, for example, are people prudent about cancer in their private lives? They don't smoke. They eat diets with little charbroiled food and lots of fiber. *But* prudent people do not: refuse to go to an important business meeting because one of the participants occasionally smokes; go without breakfast when all that is available on the menu is regular cereal rather than their usual high fiber cereal; or, order lobster for their children because it is the only food on the menu that isn't charbroiled. Prudence means you take steps to control risks but at a modest cost. You keep some sense of proportion and you don't go overboard.

How could prudent people manage their risks from 60 Hz electric and magnetic fields if they wanted to? Not by tearing all the wiring out of their house. That would be extreme. But, they could put away their electric blanket (or electrically heated water bed) and go back to using regular blankets.<sup>6</sup> Or, they could use the electric blanket to pre-heat the bed, and then unplug it before going to bed (the magnetic field disappears when the blanket is switched off, the electric field may remain as long as the blanket is plugged in). Small electric motors produce

---

<sup>6</sup>There may be a few people, such as those who have circulatory problems, for whom an electric blanket is very important. For these people the cost of going without an electric blanket may be too high to make this a prudent step.

strong magnetic fields. If you want to reduce your field exposure you might look around for small electric motors that you are often close to. For example, a motor driven electric clock on your bedside table may produce a fairly strong magnetic field by your head. If you want to practice prudent avoidance you could move it to a dresser across the room or replace it with one of the newer digital clocks or with a travel clock or wind-up clock.

If you are buying a new home it might be prudent to consider the location of distribution and transmission lines as one of *many* things you consider. However, remember that even if fields are ultimately demonstrated to pose a health risk, things like traffic patterns in the streets and radon levels in the house are likely to be more important for your own or your children's overall safety than anything related to fields. If you are already in a home, moving in order to get away from existing lines goes beyond what we would consider prudent.

State regulators who wish to exercise prudence about the exposures that people receive from power lines should, until more is known, limit their concern to new facilities. This is because even under the most pessimistic assumptions it is hard to justify the costs of modifying old facilities. Regulators who want to exercise prudence should site new facilities so as to keep people out of fields, but only up to some practical limit. Spending amounts as high as a few thousand dollars to avoid exposing someone might be justified.<sup>7</sup> Much larger expenditures can almost certainly *not* be justified. There are various ways to implement prudent avoidance.<sup>8</sup> Setting a field strength limit for the edge of the right of way

prudent (adj.):  
judicious or wisely  
cautious in practical  
affairs



---

<sup>7</sup>If exposure to fields does involve health risks, only a small fraction of those exposed are likely to have their health affected. Hence, an investment of \$1000 per exposure avoided could amount to an investment of millions of dollars, or more per health effect avoided.

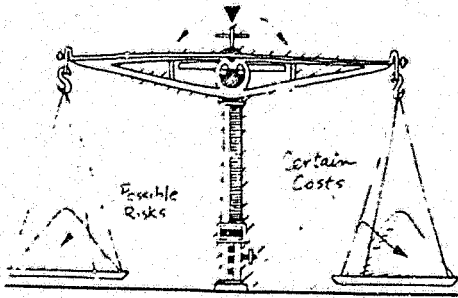
<sup>8</sup>Readers interested in more detailed discussions of this issue and the judgments involved can find them in two articles by Granger Morgan, Keith Florig, Indra Nair and Gordon Hester: "Controlling Exposure to Transmission Line Electromagnetic Fields: A regulatory approach that is compatible with the available science," which appeared in *Public Utilities Fortnightly*, March 17, 1988, pages 49-58 and "Power Frequency Fields: the regulatory dilemma," which appeared in *Issues in Science and Technology*, Summer 1987, pages 81-91.

may not be the best strategy. However, if this approach is chosen, regulators should make it clear that they are motivated by a desire to achieve "prudent avoidance" and that the levels chosen do not constitute "safe field levels." We just don't know how to choose such levels today.

### **Can an aggressive program of regulation and control be justified?**

Taking more drastic action than that indicated by "prudent avoidance" will cost a lot of money and create a fair amount of disruption. Few people would object if they were confident that 60 Hz fields pose a serious health risk. But, because our understanding of the science of this problem is still very incomplete, there is a real chance that some or all of the expense and associated trouble that would result from "aggressive action" taken now, would ultimately turn out to have been ineffective. There are two ways this could happen. First, it could turn out that there are no health risks from fields or that there are risks but they are very small. Second, it could turn out that while there are risks, we've done the wrong things to control them and gotten little or no improvement for our money because of our incomplete understanding of dose (see the discussion on "more may not be worse" on pages 21 and 23).

In our discussion of the strategy of "prudent avoidance" we argued that today it is hard to justify spending more than a few thousand dollars per person exposed in order to reduce exposures. We said this because we believe that if fields pose health risks, only a very small fraction of all the people exposed can be expected to develop



adverse health consequences (probably no more than one in many thousands). That means that spending a few thousand dollars per exposure avoided amounts to spending millions of dollars *or more* per possible health effect avoided.<sup>9</sup>

If someone concludes that drastic action on fields is appropriate today, and does not wish to make safety expenditures for fields which are dramatically larger than the expenditures we make to guard against other risks in our society, they must have concluded that the health risks from fields are significantly more common than one in several thousand people exposed.<sup>10</sup>

In order to understand what this means, consider the table on the next page which lists the approximate number of deaths that occur each year in the United States from a variety of causes. For example, auto accidents kill about 50,000 of the roughly 2,100,000 Americans who die each year. This means that when the average American dies, the chances are about 1 in 40 that his or her death will result from an auto accident.

We argued above that someone could justify "aggressive action" today only if they believe that the lifetime risk

---

<sup>9</sup>The U.S. spends up to a few million dollars per death avoided in job safety programs. However, it only spends a few hundred thousand dollars per death avoided on more common risks like preventing motor vehicle accidents. The amount most people want to spend to avoid risks depends on other things besides the odds of death. Considerations such as equity, controllability and the extent to which exposure is voluntary are all important. Thus, the arguments that follow are approximate.

<sup>10</sup> Remember that there have not been dramatic increases in the numbers of deaths or illnesses as electrification has occurred. Of course, on the other hand, some might argue that the improvements in life expectancy that have occurred over the past half century might have been even greater without field exposure.

## Data on Deaths in the United States.

Cause of death.	Approximate number of Americans who die each year from this cause.	Approximate odds that when the <i>average</i> American dies it will be from this cause.
Disease (all kinds)	2,000,000	1 in 1.1
Heart disease	770,000	1 in 2.7
Cancer (all kinds)	480,000	1 in 4.4
Accidents (all kinds)	95,000	1 in 22
Auto accidents	48,000	1 in 44
Diabetes	37,000	1 in 57
Suicide	31,000	1 in 68
Homicide	21,000	1 in 100
Drowning	5,900	1 in 360
Fire	4,800	1 in 440
Asthma	4,000	1 in 530
Firearm accidents	1,500	1 in 1400
Viral hepatitis	1,000	1 in 2100
Electrocution	850	1 in 2500
Car-train accidents	570	1 in 3700
Appendicitis	510	1 in 4100
Pregnancy and related	470	1 in 2200
Lightning	78	1 in 27,000
Floods	58	1 in 36,000
Tornado	58	1 in 36,000
Fireworks	8	1 in 260,000
Botulism	2	1 in 1,100,000

Notes: The total population of the United States is about 242,000,000. About 2,100,000 Americans die from all causes each year. The table reports data for some of these causes. The numbers in this table have been rounded to two figures (for example, 67,742 is reported as 68). The odds reported in the right-hand column are for the *average* American. Note the odds reported for pregnancy and related causes are only for women. Since people have different backgrounds and behaviors the *individual* risks they face will generally be somewhat different than these numbers. For example, someone who never smokes will probably have a smaller risk of dying from cancer than the 1 in 5 odds reported here. Someone who scuba dives frequently probably stands a higher chance of drowning than the average American. Numbers based on *Vital Statistics for the United States, 1986*, U.S. Dept. of Health and Human Services publication PHS88-1122, Washington, DC, 1988.

faced by people exposed to fields is well above one in several thousand. Electrocution has an average lifetime mortality risk of about 1 in 2500. Appendicitis has an average lifetime mortality risk of about 1 in 4000. That means that someone would have to believe that the risk of death in populations exposed to fields is as large as those risks faced by the general population that lie well above the shaded band in the table before they would be justified in calling for "aggressive action" today. If you think the risk, if any, for exposed people probably does not lie well above this shaded band, you should seriously consider selecting either the strategy of "prudent avoidance" or "no action," at least until the situation is better understood. Otherwise you will end up calling for society to spend far more to protect its members against possible deaths from this uncertain risk than it does to protect its members against deaths from other known risks.

### **Haven't some states passed standards for fields from transmission lines?**

Yes, several states have established standards for the strength of electric fields from high voltage transmission lines and Florida has also established magnetic field standards. While some of these have been set as "safe field" standards, some states, especially Florida, have understood that with the incomplete science now available only "prudent exposure avoidance" can be used as a justification for establishing a standard. Current state standards are summarized in the table on the top of the next page. No states have set standards for distribution lines.

## State regulations that limit field strengths on transmission line rights of way

State	Field Limit
Montana	1 kV/m at edge of RoW in residential areas
Minnesota	8 kV/m maximum in RoW
New Jersey	3 kV/m at edge of RoW
New York	1.6 kV/m at edge of RoW
North Dakota	9 kV/m maximum in RoW
Oregon	9 kV/m maximum in RoW
Florida	10 kV/m (for 500 kV), 8 kV/m (for 230 kV) maximum in RoW 2 kV/m at edge of RoW all new lines, 200 mG (for 500 kV single circuit), 250 mG (for 500 kV double circuit) and 150 mG (for 230 kV) maximum at edge of RoW

### Are there standards for field exposure outside the U.S.?

Standards or guidelines for exposures to power-frequency electric fields exist in Britain, Japan, Poland, and the Soviet Union. These foreign standards are not significantly different than state standards in the U.S. For example, guidelines in the Soviet Union recommend that fields in publicly-accessible areas be no greater than 10 kV/m and that fields in permanently occupied areas be no greater than 2 kV/m. There are presently no national regulations in any country limiting exposures to power-frequency magnetic fields from power lines or appliances.

The International Radiation Protection Association, whose mission is to review scientific evidence and propose safety standards, has issued draft exposure guidelines for power-frequency electric and magnetic fields. They call for a limit of 5 kV/m for continuous exposures to electric fields and 2 Gauss (2000 mG) for magnetic fields.

## **Other Things People Sometimes Ask About.**

### **How about cardiac pacemakers? Can strong fields affect them?**

Most modern cardiac pacemakers are unaffected by even the fairly strong fields produced by high voltage transmission lines. The operation of a few models, including a number manufactured by Cordis, reportedly have been affected by strong 60 Hz fields. If you use a cardiac pacemaker, it is best to consult with your physician before going into strong fields.

### **What about being close to water? Would that figure in any health risk from 60 Hz fields?**

No. There *is* an electrical hazard associated with being close to water: a greater chance of shock and electrocution. If you are in water you are usually well grounded. If, while you are well grounded, you touch something like a defective electric appliance you could get a much more severe shock than you would get if you touched it when you were not well grounded. This is one reason why you should never use appliances in the bath (another is the electrocution risk if the appliance is dropped in the bath water, which would have the effect of connecting you to the electric line).

But, none of this has anything to do with possible health risks from 60 Hz fields. If there are such risks, there is no reason to think that being close to water, such as lakes or rivers, would have significant consequences.

### **Is there some link between fields and ozone?**

None that is of any environmental importance.

If an electric field is strong enough it can break down or "ionize" molecules in the air and cause sparks or "corona." This can generate small amounts of ozone. It also makes the crackling noise you may have heard around some high voltage lines. It takes energy to make corona. Since energy costs money, electric companies try to design high voltage power lines so as to minimize corona. The conditions under which air will break down depend a bit on weather. Sometimes, especially in foggy or humid weather, very high voltage lines will produce corona. When this happens small amounts of ozone are generated.

The amount of ozone generated by a power line is much less than the amount generated by other sources such as factory emissions and motor vehicle exhaust. Ozone produced by power lines is not a significant contributor to local or regional air pollution problems and poses no significant risk to people or the environment.

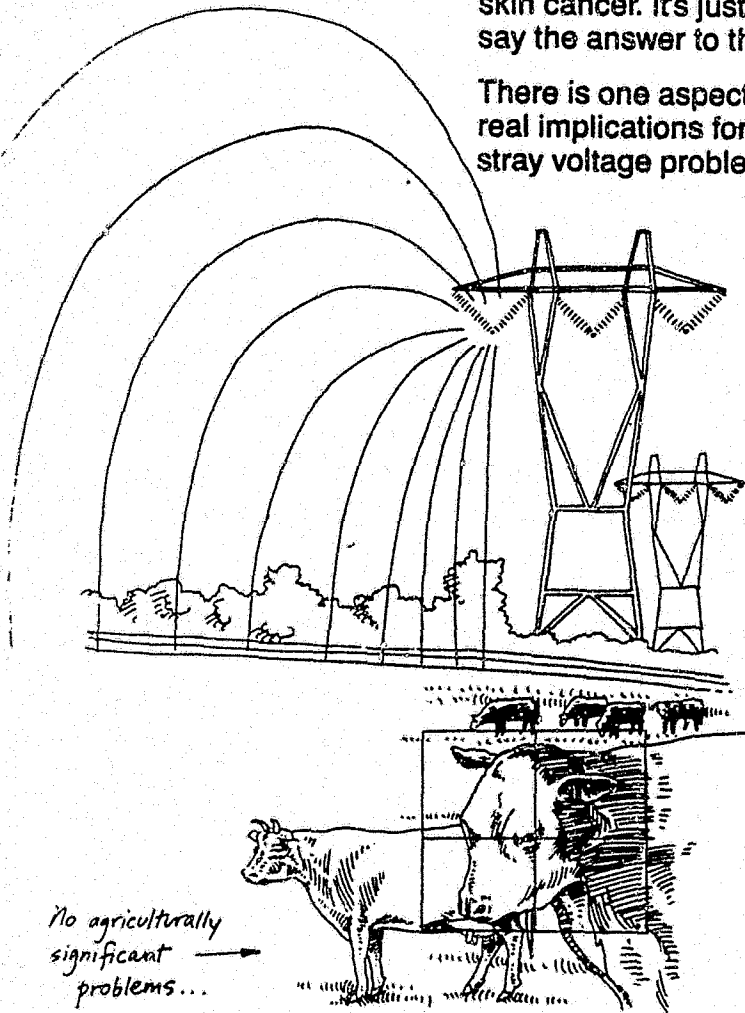
While some places have an air pollution problem resulting from too much ozone in the low atmosphere (the troposphere), you may also have heard that there is not enough ozone in the high atmosphere (the stratosphere). Ozone in the stratosphere is important because it blocks out ultraviolet light from the sun. Air in the troposphere does not usually mix with air in the stratosphere. Power lines and 60 Hz fields have nothing to do with the issue of stratospheric ozone.

## Do 60 Hz fields from power lines pose significant risks to farm crops and animals?

The answer is a simple no. There have been quite a number of studies of field crops grown in strong fields. There have also been quite a number of studies of things like meat and milk production. All of these studies show no significant effects.

If it turns out that fields do pose health risks to people, similar effects may of course be seen in farm animals. But even under the worst assumptions, these effects would be pretty rare. They might be common enough for us to worry about them as a health risk in people, but they will be rare enough that they will have no significant economic implications for farmers. For example, skin cancer from sunlight is something we as people worry about. But farmers don't worry about their pigs getting skin cancer. It's just too rare to matter. That is why we say the answer to this question is a simple no.

There is one aspect of electric power that can have very real implications for dairy farmers. This is the so-called stray voltage problem. When metal feeders, water



troughs, or milking machines are inadequately grounded, cows can be subjected to small but perceptible electrical shocks. This can lead to changes in animal behavior (reluctance to enter a milking stall for instance) and reductions in milk production. The problem can usually be fixed with proper grounding or other technical procedures. The problem does *not* come from the direct effect of exposing the cows to fields.

The only other situation that has been identified in which power lines can be important in agriculture is when bee hives are installed *directly* underneath very high voltage power lines. Again the problem is not from exposing the bees to the field. Rather it comes from voltages that are induced in the hive. Effectively, the bees get shocks as they walk around and, not surprisingly, honey production can drop substantially. If a shield, such as a piece of grounded chicken wire, is installed over the hive, then the problem is eliminated and honey production returns to normal. Still, it is best not to locate bee hives under transmission lines.

### **Do 60 Hz fields pose significant risks to the environment?**

As with agriculture, the answer is again a simple no. Studies of trees and ecosystems have shown no significant effects from 60 Hz or other low frequency electric and magnetic fields. As with agriculture, if there do turn out to be health risks for people we might expect to see occasional effects in other living things as well. But even under the worst conditions these effects will be so rare that they will only involve individual plants and animals and will not affect the operation of the overall ecosystem.

Some migratory animals like birds and fish appear to use naturally occurring fields as one of their cues in navigation. However there is no evidence of manmade fields from power lines, radio antennas or other field creating objects causing serious disruptions.

There are experimental studies in which coniferous trees (pines, spruce, firs, etc.) grown *right next* to very high voltage power lines have experienced needle damage. This is because the fields at the tips of the needles on these trees were so high that they caused the air to break down electrically (like the blue flashes you may see when you stroke a cat in the dark on a dry winter night). Normally trees are trimmed far enough back from transmission lines to preclude this effect.

### **Who is supporting research on possible health risks from 60 Hz electric and magnetic fields?**

In the United States major support for research on possible health risks from low frequency electric and magnetic fields comes primarily from the Electric Power Research Institute (EPRI), the U.S. Department of Energy and the U.S. Navy. In the past there was substantial support from the State of New York but most of this has now ended. In the past there was also modest support from the Environmental Protection Agency but that has stopped. Several individual utilities, including Bonneville Power Administration and Southern California Edison, support research.

After a number of years of growing support, the past few years have witnessed a marked decline in the level of federal support. Department of Energy expenditures fell from a high of just under \$5 million in 1985 to about \$2 million in 1988 but have apparently now begun to recover. The drop in funding was not because the problem had been solved. Quite the contrary. The funding drop simply resulted from general federal budget cutting. If the 60 Hz fields problem is ever going to be properly understood, a strong and stable program of federal research support will be necessary.

Outside of the United States there are significant research programs underway in a number of other countries including (in approximate descending order of funding levels) Sweden, the United Kingdom, West

Germany, Canada, Japan, Italy, France, Finland, and Norway. Some research is also being done in the Soviet Union, Eastern Europe and China.

Most research has focused on possible health effects. Recently EPRI has begun research on how fields associated with electrical systems might be reduced. More work on this issue is needed, especially for distribution lines, house wiring, and appliances.

### **Who wrote this brochure?**

As we explained on the inside of the front cover, the primary author for this brochure was Dr. Granger Morgan of Carnegie Mellon University. He had help from a number of colleagues. Before the brochure was published it was reviewed by a large number of experts and lay people who offered extensive advice on how the brochure could be improved. While we followed much of this advice, the final product is Dr. Morgan's responsibility. The judgments expressed in the brochure are his.

Granger Morgan is Head of the Department of Engineering and Public Policy at Carnegie Mellon University where he is also a professor in the Department of Electrical and Computer Engineering. He was trained in science and engineering at Harvard, Cornell and the University of California. He has worked for many years on environmental problems and in risk analysis. Most of his work on these topics has been funded by the U.S. National Science Foundation. He has served as a member of a number of scientific advisory panels for the U.S. Environmental Protection Agency. He is currently a consulting member of the EPA's Clean Air Science Advisory Committee. He is a Fellow of the Institute of Electrical and Electronics Engineers.

In 1982 Dr. Morgan was asked by the U.S. Department of Energy to put a group together at Carnegie Mellon to do risk analysis on the issue of possible risks of 60 Hz fields. The group studied the problem intensively for

three years, carefully reviewing the scientific literature, visiting many of the key investigators in their laboratories, and participating in many national research conferences. The Carnegie Mellon group has published a number of research papers on the risk and public policy aspects of this subject. However, because of the many scientific ambiguities in the field, the group concluded that it would not be possible to perform a meaningful risk assessment on 60 Hz fields until more complete scientific understanding was available. Rather than continue to use up scarce DoE research money they informed DoE of their conclusion and the work ended.

More recently, both the Department of Environmental Resources of the State of Florida and the Office of Technology Assessment of the United States Congress have contracted with Dr. Morgan and his associates for help in dealing with assessment and regulatory problems related to 60 Hz fields.

Dr. Morgan has worked hard to remain impartial on this very controversial topic. He has never testified on behalf of any electric utility company. He has never been a participant in any power line siting controversy. The bulk of his research support has been, and remains, in areas outside of the topic of 60 Hz fields.

## Summary of This Brochure

Here's a brief summary of the key points in this brochure.

- Electric and magnetic fields are found throughout nature and in all living things. They hold matter together. They are necessary for the operation of the nervous system.
- 60 Hz (60 cycles per second) electric and magnetic fields come from electric power. They are found around all electrical appliances, house wiring, power lines in the street, and high voltage transmission lines.
- There is clear evidence that 60 Hz fields can produce various hormonal and other changes in living things. It is not yet clear if these changes can result in risks to public health.
- Possible risks of concern include the promotion of cancer (i.e. helping the growth of existing cancer); developmental abnormalities (i.e. birth defects); and various neurological effects such as chronic depression.
- There have been many very good scientific studies of the possible health risks of fields. Taken together, the results are very complicated. Careful and responsible scientists do not yet agree on whether 60 Hz fields pose a risk to public health and, if they do, how serious that risk might be.
- It is not clear what aspect of 60 Hz fields (if any) poses a risk. There is evidence that suggests that across the range of field strengths commonly encountered by people, *stronger fields may not pose greater risks than weaker fields*. This means that the usual assumption that "more is worse" may not be correct for the case of 60 Hz fields. With the scientific evidence that is now available, it is not possible to establish a "safe field" standard.
- If individuals and society are concerned about the possible risks from fields they can take prudent steps to avoid exposure to fields, while avoiding large unjustified expenditures. For example, individuals can stop using electric blankets, and society can try to avoid building new lines very close to people.
- 60 Hz fields do not pose a significant risk to agriculture or to ecosystems.
- There is a great deal of research going on to learn more about the possible health risks of 60 Hz fields. New evidence from this research should help to reduce some of the current uncertainty.

## Glossary

**AC:** The abbreviation for alternating current. An AC current, or an AC field, changes strength and direction in a rhythmically repeating cycle.

**amp:** The units used to measure current. Abbreviated A.

**charge:** The electrical property of matter which is responsible for creating electric fields. There are two kinds of charge labeled positive and negative. Electric fields begin on positive charges and end on negative charges. Like charges repel each other. Unlike charges attract each other.

**circadian rhythm:** The rhythmic biological cycle (of things like hormone concentrations in the body) that usually recurs at approximately 24 hour intervals.

**contact current:** The current that flows in the body when a person touches a conducting object (e.g., a metal refrigerator) that has a voltage induced on it because it is in an AC field.

**current:** An organized flow of electric charge. Current in a power line is analogous to the rate of fluid flow in a pipeline. All currents produce magnetic fields. Current is measured in amps.

**DC:** The abbreviation for direct current. A DC current, or a DC field, is steady and does not change strength or direction over time.

**distribution line:** A power line used to distribute power in a local region. Distribution lines typically operate at voltages of between 5 and 35 kV, much lower than the voltages of transmission lines. However, the currents on some distribution lines can be comparable to transmission line currents.

**DNA:** Deoxyribonucleic acid, the complex, usually helically shaped chemical compounds from which the genetic material of genes and chromosomes is made.

**dose:** The amount of exposure of a kind that produces effects. In the case of chemical pollutants, dose is usually the amount of chemical that gets into the body. In the case of fields, it is often unclear what aspect of the field, if any, is involved in producing effects. Hence, it is not clear how to measure dose from electromagnetic fields.

**electric field:** A representation of the forces that fixed electric charges exert on other charges at a distance. The electric field has a strength and direction at all points in space which is often represented diagrammatically by field lines. Electric field lines begin on positive charges and end on negative charges.

**electromagnetic field:** A field made up of a combination of electric and magnetic fields.

**epidemiology:** The study of the distribution and factors that cause health related conditions and events in groups of people, often making use of statistical data on the incidence of disease or death.

**gauss:** A common unit of measure for magnetic fields. Abbreviated G. There are 10,000 gauss in one tesla.

**hertz:** A cycle per second. A unit used to measure frequency. In America, AC power has a frequency of 60 Hz. In most of Europe, AC power has a frequency of 50 Hz. Radio waves have frequencies of many thousands or millions of hertz. Abbreviated Hz.

**Hz:** The abbreviation for hertz. A cycle per second.

**hormone:** A chemical substance produced by a part of the body and used to send information to some other part of the body. Many people associate the word hormone with sex hormones, substances produced by the sex glands. There are many other kinds of hormones such as insulin which helps the body use sugar, and cortisol which helps to control inflammation.

**impedance:** The electrical property of a conductor or circuit which resists the flow of an electric current. Impedance is similar to resistance (see below) but may involve a change in the current's phase.

**initiator:** Any agent, such as ionizing radiation and some chemicals, which can start the process of turning normal cells into cancer cells.

**kV:** The abbreviation for kilovolt. A thousand volts.

**kV/m:** The abbreviation for kilovolt per meter. A thousand volts per meter. The strength of an electric field is measured in volts per meter.

**leukemia:** A general word used to refer to a number of different types of cancers of the blood forming tissues.

**magnetic field:** A representation of the forces that a moving charge exerts on other moving charges *because they are moving*. The magnetic field has a strength and direction at all points in space which is often represented diagrammatically by field lines. Magnetic field lines form closed continuous loops around currents. All currents produce magnetic fields.

**microwaves:** Electromagnetic waves which have a frequency of between roughly 1 billion and 300 billion Hz (a wave length of between roughly 30 centimeters and 1 millimeter). Microwaves have a frequency higher than normal radio waves but lower than heat (infrared) and light. In contrast to x-rays, microwaves are a form of non-ionizing radiation (see x-rays below). Strong microwaves can produce biological damage by heating tissue. Sixty Hz fields cannot do this.

**phase:** The timing with which an alternating current, voltage or field is changing strength and direction. See "three phase power" below.

**pineal melatonin:** The endocrine hormone melatonin that is produced by the pineal gland in the brain. Melatonin is involved in the control of circadian rhythm in at least some animals.

**promoter:** any agent, such as some chemicals, which can aid or accelerate the growth of cancer.

**radiation:** Any of a variety of forms of energy propagated through space. Radiation may involve either particles (for example alpha-rays or beta-rays) or waves (for example, x-rays, light, microwaves or radio waves). Ionizing radiation such as x-rays carries enough energy to break chemical and electrical bonds. Non-ionizing radiation like microwaves does not. Most of the energy in the 60 Hz fields associated with power lines, wiring and appliances does not propagate away from them through space. Hence, it is best not to refer to these fields as radiation.

**resistance:** The electrical property of a conductor that resists the flow of an electric current without changing its phase.

**RNA:** Ribonucleic acid. Complex chemical compounds in cells that are copied from DNA. RNA carries information and material that cells use to make proteins.

**stray voltage:** A condition occurring on dairy farms in which cows are subjected to small but perceptible electrical shocks which can lead to changes in animal behavior and reductions in milk production. The problem can usually be fixed with proper grounding of equipment. The problem is *not* a direct effect of exposing the cows to fields and can occur without large power lines being involved.

**three phase power:** Ordinary 60 Hz current involves only one "hot" wire or phase. Most high voltage transmission lines involve three "hot" wires or phases. The voltage and current in these three wires do not all reach their peak values at the same time. First one, then the next, then the third, reaches maximum, 1/180th of a second apart. The three work together as one line for transmitting electric energy. Three phase power is used because it is a more efficient way to transmit electric power than single phase power.

**tesla:** A unit of measure for magnetic fields. Abbreviated T. There are 10,000 gauss in one tesla. A microtesla ( $\mu$ T) is one millionth of a tesla or .01 gauss.

**transmission line:** A power line used to carry large quantities of electric power at high voltage, usually over long distances. Transmission lines typically operate at voltages of between 69 and 765 kV. They are usually built on steel towers or very large wooden poles.

**voltage:** A measure of electric potential, the amount of work that must be done to move a charge from ground to a location in space such as a power line conductor. Voltage in a power line is analogous to pressure in a pipeline. Voltage is measured in volts. Abbreviated V.

**V/m:** Abbreviation for a volt per meter. The strength of an electric field is measured in volts per meter, or sometimes in thousands of volts per meter (kV/m).

**X-rays:** A form of electromagnetic waves similar to light but with a shorter wavelength (higher frequency). X-rays are a form of ionizing radiation. They can damage biological systems by breaking chemical or molecular bonds. Sixty Hz fields cannot do this.

## Appendix: How to learn more.

The scientific literature on 60 Hz fields is large and is growing rapidly. Published every three months by the Bioelectromagnetics Society, *Bioelectromagnetics* is the single most important scientific journal in this field. Many of the most important results are published here. There are two commercial newsletters (both fairly expensive but both well done) *Transmission and Distribution Report* (720 Washington Avenue, Southeast, Suite 201, Minneapolis, Minnesota 55414-2917) and *Microwave News* (P.O. Box 1799, Grand Central Station, New York, NY 10163) which carry non-technical reports on the latest scientific, regulatory and other developments in this field. There are two large scientific meetings each year at which many of the scientific investigators present their latest research findings: the annual meeting of the Bioelectromagnetics Society (usually in June) and the annual DoE/EPRI Research Contractors Meeting (usually in November). Both are open to the public.

There are a number of published reviews of the scientific literature. They vary considerably in coverage and level of technical detail. Unfortunately the best reviews are in the form of reports, not books. It may take a bit of effort to track down copies of some of them.

At the request of the Office of Technology Assessment of the United States Congress we have recently completed:

U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric and Magnetic Fields — Background Paper*, prepared by I. Nair, M.G. Morgan, H.K. Florig, of the Department of Engineering and Public Policy, Carnegie Mellon University, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989).

This report, written for a Congressional audience, explains what 60 Hz fields are, discusses human exposure to fields, summarizes many of the biological effects, discusses the epidemiological evidence and discusses alternative policies that might be adopted.

Another recent review intended for a general audience is:

*Electrical and Biological Effects of Transmission Lines: A Review*, Technical Report prepared by J. Lee, J.H. Brunke, G.E. Lee, G.L. Reiner and F.L. Shon of the Bonneville Power Administration of the U.S. Department of Energy (Portland, Oregon 97208), 1989.

The Bonneville Power Administration (BPA) is the big federal power system in the Pacific Northwest. This report reviews 60 Hz biological effects as part of the BPA documentation required by the National Environmental Policy Act dealing with environmental impacts of electrical transmission facilities. The report focuses heavily on high voltage transmission lines and their associated fields.

are getting a bit old, two special reports prepared for the states of Florida and contain fairly comprehensive semi-technical reviews. They are:

*Biological Effects of High Voltage AC transmission lines with reference to the Colstrip*  
t: Garrison-Spokane HVTL, Technical Report prepared by Dr. Asher Sheppard  
Montana Department of Natural Resources and Conservation, Helena, Mon-  
1983. Available from the National Technical Information Services (5285 Port  
Road, Springfield, Virginia 22161) as Report No. PB83 207241.

*Biological Effects of 60 Hz Power Transmission Lines*, Technical Report prepared by  
Florida Electric and Magnetic Fields Science Advisory Commission for the Florida  
Electric Power Coordinating Group, Inc. (Tampa, Florida 33609), March, 1985.

Sheppard is a scientist in the research group at Loma Linda Veteran's Hospital work-  
ing on the biological effects of fields. His report provides a critical review of experimental  
results up to 1982 from the perspective of determining their implications for human  
health. The review includes a fairly extended discussion of results obtained from experi-  
ments on cells. The Florida report was prepared by a six-member committee appointed  
by the Department of Environmental Regulation of the State of Florida. It contains a fairly  
complete review of the literature up to 1985. It places somewhat less emphasis on  
cellular level results than the Sheppard review.

One other general review is:

*Biological and Human Health Effects of Extremely Low Frequency Electromagnetic  
Fields*, Technical Report prepared by the Committee on Biological and Human  
Health Effects of Extremely Low Frequency Electromagnetic Fields, American  
Institute of Biological Sciences, Arlington, Virginia, March 1985. Available from:  
National Technical Information Service, U.S. Department of Commerce (Springfield,  
Virginia 22161) as Report No. AD/A152 731.

This report was prepared by a committee of twelve scientists, organized by the American  
Institute of Biological Sciences in response to a request from the Naval Electronics  
Systems Command. The Navy has an interest because powerful low frequency radio  
transmitters are used to communicate to submarines at sea. Thirty-one scientists, with  
very different experience and opinions about the potential biological effects of low fre-  
quency fields, acted as consultants to the Committee. The report summarizes research  
done between 1977 and 1985 in all aspects of the biological effects of electromagnetic  
fields in the frequency range from 1 to 300 Hz.

The details of interactions between fields and biological systems at the level of individual  
cells has emerged as an especially important portion of the literature on low frequency  
fields. While most of the reviews of this topic are quite technical, the Veteran's Adminis-  
tration has produced a 15-minute video tape (made at the Walt Disney studios with illus-  
trations by Frank Armitage who did "The Fantastic Voyage"). The video tape is intended  
for semi-technical and non-technical audiences. It is:

"Cell Membranes and Intercellular Communications," U. S. Veterans Administration, distributed by National Audio Visual Center (8700 Edgeworth Drive, Capital Heights, MD 20743-3701, tel: 301-763-1896).

Some of the ideas presented in this movie are still quite controversial within the research community.

Dr. Ross Adey, who heads the Research Service at Jerry Pettis Memorial Veteran's Hospital in Loma Linda, California, has produced two detailed technical reviews of this topic. They are:

*Tissue Interactions with Nonionizing Electromagnetic Fields* by W. Ross Adey in the scientific journal, *Physiological Reviews*, Volume 61, Number 2, April 1981, pp. 435-514.

"Electromagnetic Fields: Cell membrane amplification and cancer promotion," W. Ross Adey, Review paper presented at the National Council on Radiation Protection and Measurements Annual Meeting, National Academy of Sciences (Washington, D.C. 20418), 1986.

Dr. Jerome Beers, a radiologist of the Boston University Medical Center, has prepared an extensive review of the biological effects of magnetic fields. It is:

*Biological Effects of Weak Electromagnetic Fields from 0 Hz to 200 MHz: A survey of the literature with special emphasis on possible magnetic resonance effects* by G. Jerome Beers in the scientific journal *Magnetic Resonance Imaging*, Volume 7, 1989, pp. 309-331.

Readers without significant biological and other technical training will find these reviews very hard going.

ORIGINAL

SUGARMAN & ASSOCIATES

ATTORNEYS AT LAW

18TH FLOOR, CITY PLACE

101 NORTH BROAD STREET

PHILADELPHIA, PENNSYLVANIA 19107

215-751-9733

FAX 215-751-9891

ROBERT J. SUGARMAN

ALAN M. KAPLAN

MARCIA E. BERRY

DAVID A. ROBERTS

LEGAL ASSISTANT

August 27, 1991

RECEIVED

SEP 03 1991

SECRETARY'S OFFICE  
Public Utility Commission

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

Re: Application of Philadelphia Electric Company  
No. A-110550 F055

Dear Mr. Rich:

I enclose herewith Petition of Protestants for discovery from the Commission pursuant to Section 334 of the Public Utility Code.

I had previously served this on Patricia Burket, Esquire of the Office of Counsel, but she advised me that since she is functioning as Prosecutorial Staff at this time in hearings before the ALJ, the Petition should be directed to you.

Thank you for your consideration.

Sincerely,

  
Robert J. Sugarman

RJS:er  
Enclosures

cc: Tanya J. McCloskey, Esquire  
David Rosenbaum, Esquire  
Patricia Krise Burket, Esquire  
Tinku Khanwalkar, Esquire  
Paul R. Bonney, Esquire

pldngs91\Pause10.sup

DOCKETED  
SEP 03 1991

NVL

NVL

ORIGINAL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

DO  
FOLDER

BUCKETED  
SEP 03 1991  
PETITION

RECEIVED  
SEP 03 1991

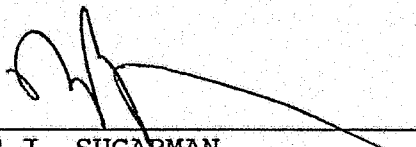
SECRETARY  
Public Utility Commission

Pursuant to Section 334 of the Public Utility Code, Protestants petition that the Commission make disclosure of certain documents, and aver as the basis thereof the following:

1. This Commission has already adopted a substantive decision with respect to the EMF issue which is before the ALJ at this time, based on non-record considerations.
2. While various Commissioners and public statements, and the Commission in its decision, alluded to various studies, there is no indication that the Commissioners and the staff may have considered other literature and other sources of information.
3. Since the question will be coming before the Commission again, and since the ALJ should have the benefit of all available information which the Commissioners considered persuasive or influential, it is appropriate, and necessary, in the interest of full disclosure, that all sources considered are made available to the Commission be known to the Protestants.
4. There is no other possible means by which the information could be made available other than disclosure by the Commissioners themselves and by the staff which wrote the Commissions' opinion based on the meeting of March 6, 1991.

5. The attached interrogatories request that the information, except for that available through seminars, which is being furnished to the Protestants as a result of the Order of the ALJ upon the Prosecutorial Staff. These interrogatories were served upon Prosecutorial Staff, which has declined to act on them pursuant to Section 334, because the Law Bureau is now acting as Prosecutorial Staff, and it would be inappropriate for the said Prosecutorial Staff to advise the Commission in responding to these interrogatories.

WHEREFORE, Protestants petition that the Commission release the information sought in the interrogatories pursuant to Section 334 of the Public Utility Code.



---

ROBERT J. SUGARMAN  
Counsel for Protestants

OF COUNSEL:

SUGARMAN & ASSOCIATES  
16th Floor, City Place  
101 N. Broad Street  
Philadelphia, PA 19107  
(215) 751-9733  
pldngs91\pause10.sup

101 NORTH BROAD STREET  
PHILADELPHIA, PENNSYLVANIA 19107

215-751-9733

FAX 215-751-9891

ROBERT J. SUGARMAN

ALAN M. KAPLAN

MARCIA E. BERRY

DAVID A. ROBERTS  
LEGAL ASSISTANT

May 31, 1991

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

Dear Counsel:

Enclosed please find Request for Production of Documents by  
Pennsylvania Public Utility Commission and Intervenors Request for  
Documents from Philadelphia Electric Company.

Sincerely,



Robert J. Sugarman

RJS/mt

Enclosures

cc: Donald Blanken, Esq.  
Tanya McCloskey, Esq.  
Patricia Krise Burket, Esq.

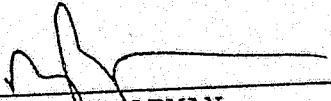
IN RE: LETTER OF NOTIFICATION : DOCKET NO. A-1103307000  
OF PHILADELPHIA ELECTRIC :  
COMPANY UNDER 52 PA :  
CODE § 57.72(d) RE: PROPOSED :  
230 KV WOODBOURNE :  
TRANSMISSION LINE :

INTERVENORS REQUEST FOR DOCUMENTS FROM  
PHILADELPHIA ELECTRIC COMPANY

Pursuant to 52 Pa. Code § 5.321 of the Rules of the Pennsylvania PUC, intervenors request production of the following documents by applicant Philadelphia Electric Company within 20 days of service:

1. System load projections, 1986 - 91.
2. Load growth projections (for winter and summer peaks) 1985 - 1991.
3. System map.
4. System reliability standards and criteria, 1985 to 1991.
5. Line capacity and KW for transmission lines in Bucks and Montgomery Counties, in whole or in part, and all lines connected to heat and substation.
6. Line diagram showing rating of high and low side buses (and number of buses) in each substation in Montgomery and Bucks Counties, and at Heaton. (Include Woodburne if located in Bucks or Montgomery Counties).
7. Applicable design standards for clearance (horizontal and vertical), pole entire height and design.
8. The clearance diagram (horizontal and vertical plan)

9. To the extent not enclosed in the above, anticipated loading on proposed new line and on substation, through 1996.
10. Annual energy consumption in area to be served by line, 1985 - 91.
11. Peak loads (peak hour and peak day) in same area, 1985 - 1991.
12. System wide peak hour 1985 - 1991.
13. System annual energy sales, 1985 - 1991.
14. In each case where data is requested from 1985 to 1981, the data is requested for each calendar year, or portion thereof.
15. System planning studies, 1985 - 1981, bearing in whole or in part on the area to be served by the line.
16. Map describing system area characterized as to be served by the line.
17. Any and all intrusions upon <sup>private</sup> personal property, including but not limited to Robert Smalls.

  
ROBERT J. SUGARMAN  
Counsel for Intervenors

Date: 5/31/91

OF COUNSEL:

SUGARMAN & ASSOCIATES  
16TH FLOOR, CITY PLACE  
101 N. BROAD STREET  
PHILADELPHIA, PA 19107  
(215) 751-9733  
pldngs91\pause.006

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

REQUEST FOR PRODUCTION OF DOCUMENTS  
BY PENNSYLVANIA PUBLIC UTILITY COMMISSION

Intervenors by their counsel seek production of the following documents from the Pennsylvania Public Utility Commission:

1. All EMF studies available to the Commission.
2. Applicable safety standards for 238 KV transmission lines being constructed new in 1991.
3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985 - 1991.
4. All documents received and/or distributed by the Commission at the EMF seminars, 1985 - 91.
5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards

to deal with EMF and/or the potential liabilities of not avoiding  
EMF exposure.



ROBERT J. SUGARMAN  
Counsel for Intervenors

Date: \_\_\_\_\_

5/31/91

OF COUNSEL:

SUGARMAN & ASSOCIATES  
16TH FLOOR, CITY PLACE  
101 N. BROAD STREET  
PHILADELPHIA, PA 19107  
(215) 751-9733  
pldngs91\pause.006

CERTIFICATE OF SERVICE

I, Robert J. Sugarman, certify that I have mailed a copy of the foregoing Petition by first class mail postage pre-paid to the following:

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Asst. Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esq.  
Penna. Public Utility Commission  
G-28, North Office Bldg.  
P.O. Box 32265  
Harrisburg, PA 17120

David Rosenbaum, Esq.  
Risk Analysis Corp.  
Suite 202, 6723 Whittier Avenue  
McLean, VA 22101  
(OCA Consultant)

Tinku Khanwalkar, Esq.  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101

Dated: 8/27/91

  
\_\_\_\_\_  
ROBERT J. SUGARMAN

ORIGINAL

PHILADELPHIA ELECTRIC COMPANY

LEGAL DEPARTMENT

James W. Durham  
Senior Vice President  
and General Counsel

Eugene J. Bradley  
Of Counsel

Bjarnie R. Anderson  
Legal Administrator

2301 MARKET STREET, BOX 8699  
PHILADELPHIA, PA 19101  
(215) 841-5544 FAX: 568-3389

Donald Blanken  
Paul R. Bonney  
Ellen M. Cavanaugh  
Rudolph A. Chillemi  
Edward J. Cullen, Jr.  
Katherine K. Dodd  
Aubra S. Gaston  
Gregory Golazeski  
E. C. Kirk Hall  
Elizabeth P. Harris  
J. Lindsay Johnston  
Kimberly Lewis  
Stephanie Whitton Lewis  
T. Michael Mather  
Mary R. McFall  
Jenny P. Shulbank  
Assistant General Counsel

September 3, 1991

RECEIVED

SEP 03 1991

SECRETARY'S OFFICE  
Public Utility Commission

Jerry Rich, Secretary  
Pennsylvania Public Utility Commission  
North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

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 Rich:

Enclosed for filing in the above-captioned proceeding are and original and two copies of Philadelphia Electric Company's Answer to Protestants' Motion to Dismiss and Deny Application, or in the Alternative, to Move the Proceedings to Encompass All Relevant Issues. As indicated on the attached Certificate of Service, I have served copies of this filing upon all parties of record.

I have attached to the original Answer a U.S. Postal Form 3817, dated September 3, 1991, to evidence filing of the Answer as of this date. I have also enclosed an additional copy of this cover letter which I request that you date-stamp and return to me.

Sincerely,

*Paul R. Bonney*

Paul R. Bonney

PRB/kn  
Enclosure

cc: Honorable Herbert Smolen  
See Certificate of Service

NVL

ORIGINAL

R

SEP 6 1988

CERTIFICATE OF SERVICE

State  
Public Utility Commission

I hereby certify that I have this day served a true copy of Philadelphia Electric Company's Answer to Protestants' Motion to Dismiss and Deny Application, or in the Alternative, to Move the Proceedings to Encompass All Relevant Issues upon the following parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54:

By First Class Mail

Honorable Herbert Smolen  
Administrative Law Judge  
Pennsylvania Public Utility Commission  
1302 Philadelphia State Office Building  
Broad & Spring Garden Streets  
Philadelphia, PA 19130

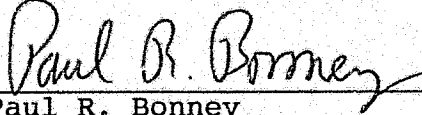
Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107  
(Counsel for Protestants)

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

(Continued)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101

  
\_\_\_\_\_  
Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: September 3, 1991

ORIGINAL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

RECEIVED

SEP 03 1991

SECTION 5 OFFICE  
Public Utility Commission

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

PHILADELPHIA ELECTRIC COMPANY'S ANSWER  
TO PROTESTANTS' MOTION TO DISMISS  
AND DENY APPLICATION, OR IN THE ALTERNATIVE,  
TO MOVE THE PROCEEDINGS  
TO ENCOMPASS ALL RELEVANT ISSUES

On August 20, 1991, the residents who have intervened in this matter ("Protestants") filed a document styled Motion to Dismiss and Deny Application, or in the Alternative, to Move the Proceedings to Encompass All Relevant Issues. Philadelphia Electric Company ("PECO" or the "Company"), by its attorneys, answers the Protestants' Motion as follows:

Protestants' Motion raises two alternative requests for relief: (1) that Administrative Law Judge Smolen (the "ALJ") at this time deny the Company's "application" (i.e., the Company's December 21, 1989 Letter of Notification, which the Commission already approved by Order entered February 9, 1990) or (2) that the ALJ "redefine the proceedings to encompass all relevant issues" (e.g., to include consideration of "need"). The ALJ should deny the Motion for two reasons, as explained more fully

below. First, the relief requested by Protestants' Motion is beyond the limited scope of this recommended proceeding. Second, in support of its arguments the Motion mischaracterizes the record evidence.

I. The Motion's Requested Relief is Beyond the Limited Scope of this Remanded Proceeding

As the ALJ recognized in his July 18, 1991 Prehearing Order in this proceeding (pages 1-2), Commonwealth Court Judge Palladino's Remand Order concluded that the Protestants are entitled to a hearing, but only on "the question of whether they will be adversely affected by the reconductoring of the high tension electrical line at issue in this case".<sup>1</sup> Similarly, in its Order entered June 14, 1991 on remand, the Commission stated that the record would be opened for hearing and determination of the "sole issue of whether the Petitioners will be adversely affected by the reconductoring of this former Conrail line . . . ." (Emphasis added) In fact, the Commission reiterated the limited scope of the hearings in ordering paragraphs 1 and 3 and further stated: "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."

---

<sup>1</sup> Contrary to the assertion in paragraph 1 of Protestants' Motion, the Court did not "declare the application to have been improperly approved . . . ."

The Protestants' first request, that the ALJ "deny the application," is clearly beyond the scope of this remanded proceeding. The question of whether to approve or deny the Company's previously approved Letter of Notification is simply not before the ALJ. Likewise, with respect to the Protestants' alternative requested relief to expand the proceedings, the ALJ confirmed at page 5 of his July 18, 1991 Order that "need for the line is not an issue in this reopened proceeding."<sup>2</sup> Indeed, the ALJ (Order pages 4-5) made it clear that the evidence presented in this proceeding "shall be limited to matters which fall within the Commission's jurisdiction to consider and which are within the scope of this proceeding as defined by the Commonwealth Court and the Commission." In short, the Motion requests that the ALJ rewrite and expand Judge Palladino's Order and the Commission's Order, which request is beyond the ALJ's authority to grant. Thus, the Protestants' Motion must be denied.

It is worth noting that the Motion puts forth only one argument in support of its position that the Company's "application" should be denied. At paragraph 10, the Motion states that the Company's initial November 21, 1989 "application" is "per se deficient, in that it fails to satisfy the regulations

---

<sup>2</sup> Notably, the ALJ found that need is not an issue notwithstanding the argument otherwise by the Protestants' at the Prehearing Conference and in their Prehearing Memorandum (pages 4-5).

at 52 Pa. Code § 57.75(a)(2)<sup>3</sup> by failing to identify and evaluate "route alternatives". Besides being untimely made, that argument is completely without merit. The Commission's regulations do not require, in a Letter of Notification filing as opposed to an Application for authorization to locate and construct an HV transmission line, a description of reasonable alternative routes or a comparison of the merits of each route. See 52 Pa. Code §§ 57.72(c)(10) and (d).

Regarding the alternative relief requested -- and assuming that the ALJ had the authority to expand the proceedings as the Protestants' suggest, which he does not -- the Motion has not presented compelling reasons why the record in this proceeding should be burdened with evidence concerning need for the line. The Company submits that it is more administratively efficient, and "rational", to consider in this proceeding only the question that the Commonwealth Court and Commission order be considered -- namely, whether the Protestants will be adversely affected in some legally and factually recognizable way by the reconductoring of the line.<sup>4</sup>

---

<sup>3</sup> There is no 52 Pa. Code, § 57.75(a)(2), so the cite at paragraph 10 of the Motion is incorrect.

<sup>4</sup> The Company notes that it has not, as the Motion (paragraph 4) asserts, "recognized that the issue of alternatives (which traverses into need) inevitably, is a part of this proceeding at this time, by presenting testimony as to alternatives through its initial witness." Rather, the Company presented testimony regarding alternative line designs to satisfy the specific request for information set forth in Commissioner Rhodes' June 13, 1991 statement and pursuant to the ALJ's direction (Prehearing Order, page 5).

For these reasons, the requested relief is beyond the limited scope of this remanded proceeding and should be denied.

II. The Protestants' Motion Mischaracterizes the Record Evidence

In support of its arguments, the Protestants' Motions makes various references to the testimony presented by the Company's witnesses on August 15, the first day of hearings in this proceeding. Those references, however, mischaracterize or misrepresent the testimony and evidence that was actually presented.<sup>5</sup> Two examples follow.

First, the Motion states (paragraph 11) that the Company has acknowledged "effects" and that "testimony has established the adverse effect on petitioners . . . ." In addition, the Motion (paragraph 8) states that "[a]s a matter of scientific fact and law, as illustrated by PECO's brochure, the risk of injury constitutes an effect, in that prudent avoidance is required."

The Motion's statements are incorrect. The Company has not acknowledged that exposure to EMF constitutes a human health risk. Indeed, PECO witness Oedemann testified (Tr. 23) that PECO

---

<sup>5</sup> The Motion contains no specific testimony, exhibit or transcript cites, so it is difficult to determine to which evidence the Motion is referring.

is "not convinced that there is conclusive evidence that there is a health effect." Similarly, the Company's brochure on EMF, introduced as Protestants' Exhibit No. 1, states (page 1): "Are EMFs a health risk? . . . Many millions of dollars have been spent in many countries to address the question. And today the honest answer is, we just don't know." The Company does follow policies of "prudent avoidance" -- endeavoring to build transmission lines that will result in lower electric and magnetic fields (EMF) at a modest increase in cost -- in light of certain studies that have been made (Tr. 22-23). The fact that the Company practices prudent avoidance in the face of an unproven risk does not, however, satisfy the Protestants' burden of proving that they will be adversely affected by this line -- it proves only that the Company is acting responsibly. In other words, the fact that the Company considers steps to mitigate an unproven risk does not prove that the risk itself exists; it only proves prudence.

Second, the Motion states (paragraph 9) that the "Company acknowledged that it considered no alternatives which would avoid or minimize the risk, other than alternative designs within the predetermined right of way, although the right of way was acknowledged to be unusually narrow, and narrowness gives rise to more EMF." The Company's witnesses did not state that this right-of-way is "unusually narrow" or that "narrowness gives rise to more EMF." And Mr. Oedemann did testify regarding consideration of alternative routes, stating that the route

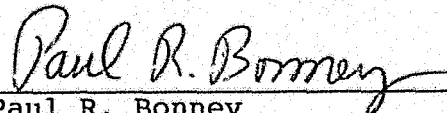
chosen was "obviously superior" to any alternatives and that the other private right-of-way into the Woodbourne substation, from the Buckingham area, was "not . . . a possibility." (Tr. 31-34).

As demonstrated above, the Protestants' Motion mischaracterizes the record evidence, and, consequently the Motion's references to the record should be ignored.

CONCLUSION

For all the foregoing reasons, the Protestants' Motion should be denied.

Respectfully submitted,



---

Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: September 3, 1991

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
September 9, 1991

In Re: A-110550F055

(See letter of 8/2/91)

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.

NOTICE

This is to inform you that in addition to the hearings scheduled by Administrative Law Judge Smolen's July 18, 1991 prehearing order, the following hearings on the above captioned case will be held as follows, all commencing at 10:00 a.m., in Room 1306, Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania:

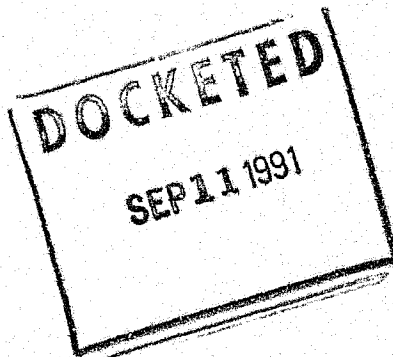
Friday, October 11, 1991  
Tuesday, October 15, 1991  
Tuesday, October 29, 1991

Please change your records accordingly.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

cc: Judge Smolen  
Mr. Bramson  
Bur. of Safety/Compliance  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested



NVL

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
September 9, 1991

In Re: A-110550F055

Elsie Knight, Chairperson  
Planning Commission  
Borough of Langhorne  
151 West Maple Avenue  
Langhorne, PA 19047

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.

NOTICE

This is to inform you that in addition to the hearings scheduled by Administrative Law Judge Smolen's July 18, 1991 prehearing order, the following hearings on the above captioned case will be held as follows, all commencing at 10:00 a.m., in Room 1306, Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania:

Friday, October 11, 1991  
Tuesday, October 15, 1991  
Tuesday, October 29, 1991

Please change your records accordingly.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

RECEIVED  
OCT 11 1991

NVZ

CERTIFICATE OF SERVICE

RECEIVED

Re: Letter of Notification  
of Philadelphia Electric  
Company Re: Proposed 230 KV  
Woodbourne to Heaton  
Transmission Line,  
Docket No. A-110550, F. 055

SEP 10 1991

SECRETARY'S OFFICE  
Public Utility Commission

I hereby certify that I have this day served a true copy of the foregoing document, Office of Consumer Advocate's Interrogatories Set I to Pennsylvania Power & Light Company 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 10th day of September, 1991.

SERVICE BY FIRST CLASS MAIL POSTAGE PREPAID

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

Ward L. Smith, Esq.  
Tom Watson, Esq.  
Crowell & Moring  
1001 Pennsylvania Ave., N.W.  
Washington, D.C. 20004

Paul R. Bonney  
Asst. General Counsel  
Philadelphia Electric Company  
2301 Market Street, 23rd Fl.  
Philadelphia, PA 19101

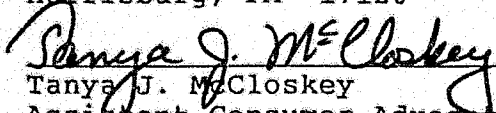
SERVICE BY TELECOPIER AND FEDERAL EXPRESS

Tinku Khanwalkar, Esq.  
Pennsylvania, Power & Light  
2 North 9th St.  
Allentown, PA 18101-1179

SEP 10 1991

SERVICE IN PERSON

Patricia Krise-Burket, Esq.  
PA PUC - Law Bureau  
Room G-28, North Office Bldg.  
Harrisburg, PA 17120

  
Tanya J. McCloskey  
Assistant Consumer Advocate

Counsel for Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120  
(717) 783-5048



OFFICE OF CONSUMER ADVOCATE  
1425 Strawberry Square  
Harrisburg, Pennsylvania 17120

IRWIN A. POPOWSKY  
Consumer Advocate

(717) 783-5048

September 12, 1991

RECEIVED

SEP 12 1991

Jerry Rich, Secretary  
PA Public Utility Commission  
Room G-18, North Office Bldg  
Harrisburg, PA 17120

SECRETARY'S OFFICE  
Public Utility Commission

Re: Letter of Notification  
of Philadelphia Electric  
Company Re: Proposed 230 KV  
Woodbourne to Heaton  
Transmission Line,  
Docket No. A-110550, F. 055

Dear Secretary Rich:

Enclosed for filing please find a Certificate of Service certifying that, on September 12, 1991 the Office of Consumer Advocate served upon Philadelphia Electric Company, and the other parties to the above-referenced case, the responses of the Office of Consumer Advocate to Interrogatories, Set II of Philadelphia Electric Company.

Very truly yours,

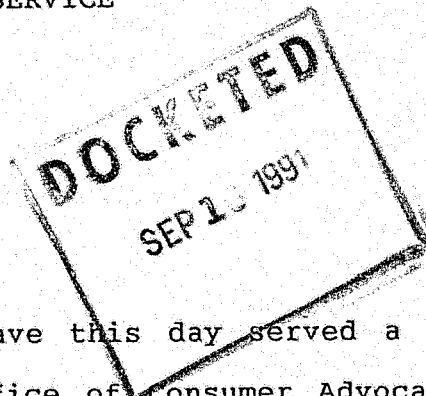
*Tanya J. McCloskey*  
Tanya J. McCloskey  
Assistant Consumer Advocate

Enclosures  
cc: All parties of record

NVL

CERTIFICATE OF SERVICE

Re: Letter of Notification  
of Philadelphia Electric  
Company Re: Proposed 230 KV  
Woodbourne to Heaton  
Transmission Line,  
Docket No. A-110550, F. 055



I hereby certify that I have this day served a true copy of the foregoing document, Office of Consumer Advocate's Responses to Philadelphia Electric Company Set II Interrogatories 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 12th day of September, 1991.

SERVICE BY FIRST CLASS MAIL POSTAGE PREPAID

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

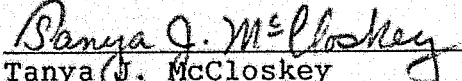
Ward L. Smith, Esq.  
Tom Watson, Esq.  
Crowell & Moring  
1001 Pennsylvania Ave., N.W.  
Washington, D.C. 20004

Paul R. Bonney  
Asst. General Counsel  
Philadelphia Electric Company  
2301 Market Street, 23rd Fl.  
Philadelphia, PA 19101

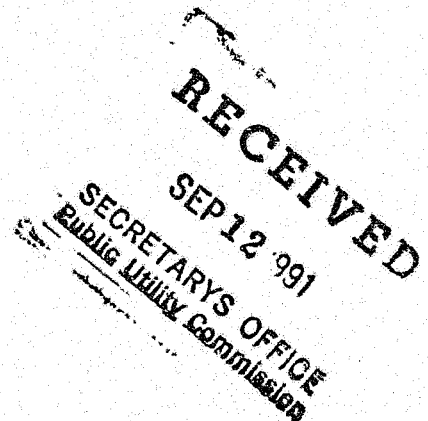
Tinku Khanwalkar, Esq.  
Pennsylvania, Power & Light  
2 North 9th St.  
Allentown, PA 18101-1179

SERVICE IN PERSON

Patricia Krise-Burket, Esq.  
PA PUC - Law Bureau  
Room G-28, North Office Bldg.  
Harrisburg, PA 17120

  
Tanya J. McCloskey  
Assistant Consumer Advocate

Counsel for Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120  
(717) 783-5048



ORIGINAL

SUGARMAN & ASSOCIATES

ATTORNEYS AT LAW

16TH FLOOR, CITY PLACE

101 NORTH BROAD STREET

PHILADELPHIA, PENNSYLVANIA 19107

215-751-9733

FAX 215-751-9891

ROBERT J. SUGARMAN

ALAN M. KAPLAN

MARCIA E. BERRY

DAVID A. ROBERTS

LEGAL ASSISTANT

September 14, 1991

RECEIVED

SEP 18 1991

SECRETARY'S OFFICE  
Public Utility Commission

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

Re: Application of Philadelphia Electric Company  
No. A-110550 F055

Dear Mr. Rich:

Enclosed please find original and two copies of Objections and Motion in Response to Interrogatories submitted by PECO, filed by Protestants.

Sincerely,

Robert J. Sugarman

RJS:er

Encl.

cc: All counsel

A 110550  
F0055

pldngs91\pause11.pet

RECEIVED  
SEP 18 1991

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

IN RE: LETTER OF NOTIFICATION  
OF PHILADELPHIA ELECTRIC  
COMPANY UNDER 52 PA  
CODE § 57.72(d) RE: PROPOSED  
230 KV WOODBOURNE  
TRANSMISSION LINE

DOCKET NO. A-110S50-F055

DOCKETED  
SEP 19 1991

DOCUMENT  
FOLDER

OBJECTIONS AND MOTION IN RESPONSE TO  
INTERROGATORIES SUBMITTED BY PECO,  
FILED BY PROTESTANTS

Protestants object to the interrogatories propounded by PECO relating to the prepared testimony of Abraham Liboff, and aver as the basis thereof the following:

1. The interrogatories request information which is oppressive and burdensome to obtain in the short time frame allowed. Specifically, the interrogatories request a complete, detailed, and laborous analysis of virtually every sentence in the testimony.


2. The interrogatories require a massive research undertaking for Dr. Liboff to document all of his accumulated knowledge, and his general review of the evolution of the understanding of EMF. They would require virtually the construction of a text book, for matters which are general and essentially background. As PECO well knows, there is simply no way for a witness to prepare such a comprehensive undertaking, because of limitations imposed both by time and financial constraints.

3. The Public Utility Commission cannot in good conscience

require homeowners being subjected to EMF by PECO to bear the enormous expense of undertaking such an effort, nor is it appropriate for the Commission to require such affected individuals to bear the cost of what is essentially a Commission responsibility.

4. There is no authority in the Commission's rules or statute to require pre-filed testimony, and the requirement of pre-filed testimony is itself unconscionable, and doubly so because of the burden imposed as indicated by this extraordinary and oppressive discovery request.

WHEREFORE, the protestants hereby object to the Interrogatories posed by PECO, and move to strike the requirement for pre-filed testimony. In the alternative, the protestants respectfully request that PECO be ordered, pursuant to the Civil Rules of Procedure, to bear the expense of the work which they have requested Dr. Livoff to perform for them.



---

ROBERT J. SUGARMAN, ESQ.  
Counsel for Protestants

CERTIFICATE OF SERVICE

I, Robert J. Sugarman, certify that I have mailed a copy of the foregoing Petition by first class mail postage pre-paid to the following:

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Asst. Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esq.  
Penna. Public Utility Commission  
G-28, North Office Bldg.  
P.O. Box 32265  
Harrisburg, PA 17120

David Rosenbaum, Esq.  
Risk Analysis Corp.  
Suite 202, 6723 Whittier Avenue  
McLean, VA 22101  
(OCA Consultant)

Tinku Khanwalkar, Esq.  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101



ROBERT J. SUGARMAN

Dated: 9/14/97

KJR



COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P. O. BOX 3265, HARRISBURG, Pa. 17120

September 19, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

ORIGINAL

RECEIVED

Jerry Rich, Secretary  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

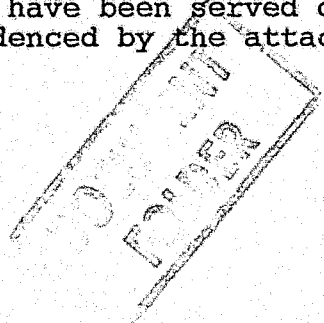
SEP 19 1991

SECRETARY'S OFFICE  
Public Utility Commission

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

Dear Secretary Rich:

Enclosed please find an original and two copies of  
the Prosecutory Staff's Answer to Petition Filed Pursuant to  
66 Pa. C.S. §333(d) Requesting the Commission to Respond to  
Protestants' Request for Production of Documents. Copies of  
this Answer have been served on all parties of record on this  
date as evidenced by the attached Certificate of Service.



Sincerely,

*Patricia Krise Burket*  
Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

Enclosures

cc: All parties of record  
ALJ Smolen

ORIGINAL

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

PROSECUTORY STAFF'S ANSWER TO  
PETITION FILED PURSUANT TO  
66 PA. C.S. §333(D) REQUESTING  
THE COMMISSION TO RESPOND TO  
PROTESTANT'S REQUEST FOR  
PRODUCTION OF DOCUMENTS

DOCKETED  
SEP 20 1991

Pursuant to 52 Pa. Code §65.61, the Prosecutory Staff files its Answer to the above-captioned Petition, and avers the following:

1. On September 3, 1991, the Prosecutory Staff, who is participating in the above-captioned case, received a copy of the Petition with an attached copy of an undated certificate of service. Service of the Petition was by first class mail. The transmittal letter was dated August 27, 1991.

2. The Commission rule at 52 Pa. Code §5.61(a) allows 20 days for an answer to be filed to petitions and 52 Pa. Code §1.56(b) allows 3 additional days whenever a participant is required or permitted to do an act within a prescribed period if service of a document on him is by first class mail. Therefore, the Prosecutory Staff believes the last day on which it may file its answer to the instant petition is September 19, 1991.

3. On May 31, 1991, the Protestants submitted a document entitled Request for Production of Documents to the Commission. No other document, or petition was attached.

4. On June 26, 1991, the Prosecutory Staff entered its appearance in the above-captioned proceeding and on July 12, 1991, after counsel for Protestants complained at a prehearing conference that the Request for Production of Documents has not been answered, the Prosecutory Staff filed objections to four of the Protestants production requests on the grounds, inter alia, that they were overly broad, vague, outside the scope of discovery and overburdensome. A copy of these objections is attached as Annex A, and the arguments contained therein are incorporated by reference.

5. The Protestants' production requests to which the Prosecutory Staff filed objections, read as follows (emphasis added):

1. All EMF [Electromagnetic field] studies available to the Commission.
2. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985-1991.
3. All documents received and/or distributed by the Commission at EMF seminars, 1985-1991.
5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards to deal with EMF, and/or potential liabilities of not avoiding EMF exposure.

On July 16, 1991, the Prosecutory Staff filed its Answer to Production Request No. 2 (attached as Annex B).

6. On August 8, 1991, the Protestants filed a Motion to Compel Response of PUC Prosecutorial Staff to Request for Production of Documents. On August 12, 1991, the Prosecutory Staff filed an Answer to the Motion to Compel (attached as Annex C). In its Answer, the Prosecutory Staff reiterated its objections to the Protestants' production requests and argued that the documents requested were not subject to the Commonwealth's Right-To-Know Law, 66 P.S. §§66.1, et seq. The Prosecutory Staff herein incorporates the arguments made in its Answer to the Protestants' Motion to Compel in its answer to the instant Petition.

7. On August 15, 1991, Administrative Law Judge Herbert Smolen, ruling on Protestants' Motion to Compel, directed the Prosecutory Staff to produce documents related to Protestants' Requests for Production of Documents Nos. 2 and 3. These productions requests involved the series of EMF seminars held during the Spring of 1991. The ALJ reasoned that since the Protestants had been invited to these seminars, they would have been given the documents distributed at the seminars anyway. The ALJ further ordered that the EMF seminar documents would be available at the Protestants' expense (August 15, 1991, N.T. p. 91).

8. At the August 15, 1991 hearing, the ALJ also determined that counsel for the Protestants intended that the

Commission itself and not the Prosecutory Staff respond to his requests for production of documents (August 15, 1991, N.T., p. 85). The ALJ explained that to serve interrogatory requests on the Commission, Protestants must follow the procedure contained in 66 Pa. C.S. §333(d) (August 15, 1991, N.T. p. 86).

9. Because of statements made in the Petition concerning the advisory versus prosecutory role of one of its members, the Prosecutory Staff believes it must first address the propriety of its filing an Answer to the instant Petition. Patricia Krise Burket, a member of the Prosecutory Staff, had been advisory to the Commission prior to the Prosecutory Staff's entry of appearance in the above-captioned proceeding. Ms. Burket had advised counsel for the Petitioners (hereinafter called Protestants) that she no longer could advise the Commission on this proceeding. However, while it is true that the Prosecutory Staff cannot advise the Commission on the proper disposition of the instant Petition, the Prosecutory Staff can file an Answer to the Petition thereby advocating its position. In so doing, the Prosecutory Staff would be representing itself before the Commission in a prosecutory role, and would not be representing the Commission or any one individual Commissioner on this matter, thereby acting in an advisory capacity.

10. The Prosecutory Staff's position on its ability to file an Answer to the instant Petition is fully consistent

with 66 Pa. C.S. §334(c) which reads in pertinent part  
(emphasis added):

No officer, employee or agent engaged in the performance of investigatory or prosecutory functions for the commission in any case shall, in that or a factually related case, participate or advise in the decision, recommended decision, or commission review, except as a witness or counsel in public proceedings.

11. In the first line of the instant Petition, a reference is made to "Section 334 of the Public Utility Code". As 66 Pa. C.S. §334 relates to "Presiding officers" and not to interrogatory requests made on the Commission, the Prosecutory Staff presumes that the aforesaid reference is a mistake, and should be 66 Pa. C.S. §333(d).

12. Section 333(d) of the Public Utility Code reads in part as follows:

Interrogatories directed to the commission shall be allowed only upon an order of the commission based upon a specific finding that the interrogating party is seeking significant, unprivileged information not discoverable by alternate means.

13. In their Petition, the Protestants state that the Commission has already adopted a substantive decision with respect to the EMF issue; and that the Commissioners and the staff may have considered other literature and sources of information not referenced in its prior decision nor incorporated into the public statements made by the

Commissioners at Public Meeting. The Protestants argue that since the EMF question is coming before the Commission again, and since the ALJ should have the benefit of all available information which the Commissioners considered persuasive, it is necessary, in the interest of full disclosure, that all sources considered to be available to the Commission be made known to the Protestants.

14. The Prosecutory Staff does not believe that the Protestants have satisfied the criteria set forth in 66 Pa. C.S. §333(d) that the information requested -- all studies on EMF and prudent avoidance available to the Commission -- is significant, unprivileged information which is unavailable to the Protestants through alternate means.

15. As the basis for their request, the Protestants assert that the ALJ should have the benefit of all the information on EMF upon which, the Protestants speculate, the Commission may have relied in its previous orders in this proceeding. The Prosecutory Staff believes that the Protestants' assertion of the speculated existence of additional EMF information which may have been relied on by the Commission previously can not support any finding that this information is significant. Furthermore, the ALJ's and the Commission's decision on the alleged public health threat caused by EMF from transmission lines will be based solely on the information which is referenced, or properly judicially noticed, or actually contained in the record made in this

proceeding by the participants, including the Protestants. The fact that one or one hundred additional articles or studies on EMF may be available to the Commission has no significant impact on this case and should work no significant hardship against the Protestants.

16. Rather than for the reasons stated in their Petition, the Prosecutory Staff believes that the Protestants may be interested in obtaining this information for other reasons, perhaps as a short-cut in their own research on EMF, or as part of a broader legal strategy to prove the existence of bias or prejudgment of the issues on the part of the Commission.

17. The Prosecutory Staff has already expressed its objections to these production requests as being nothing more than an attempt by the Protestants to take advantage of the research work done by the Commission Staff. Appendices A and C. The Prosecutory Staff believes that it is each participant's duty to research and prepare his case. That the Protestants wish to be provided with special research assistance does not support a finding that the material is significant.

18. The Prosecutory Staff postulates that the Protestants may be planning to raise the question of bias or prejudgment of the issues at some future time point in this proceeding based on previous orders adopted by the Commission in this proceeding. However, the law on bias is clear. The

general rule is that judges and administrative adjudicators are not disqualified from deciding a case a second time around after a remand. Davis, K. Administrative Law Treatise, §12.01, p. 144 (1958); U.S. v. Morgan, Morgan IV, 313 U.S. 409, 421, 61 S. Ct. 999, 1004 (1941) and NLRB v. Donnelly Garment Co., 330 U.S. 219, 236-237, 67 S. Ct. 756, 765 (1947). Adverse rulings in a previous proceeding, whether or not correct, and the judge's statements of reasons for his decision do not constitute bias. United States v. Bray, 546 F.2d 851, 857 (10th Cir. 1976). Moreover, an individual is not disqualified because he has formed opinions about a case based on his or her participation in it. Bowens v. North Carolina Dept. of Human Resources, 710 R.2d 1015, 1020 (4th Cir. 1983). An attitude or feeling a judge may entertain toward the subject does not evidence bias necessary for disqualification. Smith v. Danyo, 441 F.Supp. 171, 180 (D.C. Pa. 1977), aff'd. 585 F.2d 83 (1978). In the face of the above cited law on bias, it is inconceivable that the requested information will be of any significant value.

19. The information requested by Protestants is privileged. To the extent that the discovery request is to include Ms. Burket, who served as an advisor to the Commission prior to entering this proceeding as a member of the Prosecutory Staff, the EMF material in her possession is protected under the doctrine of attorney-client privilege. While the Prosecutory Staff realizes that the Commission can

waive this privilege, it further asserts that the material gathered by Mrs. Burket is covered by the attorney-work product doctrine. It is axiomatic that discovery of certain written material prepared in preparation for litigation, or of mental or growth processes associated with such preparation is not subject to discovery. Hickman v. Taylor, 329 U.S. 495 (1947).

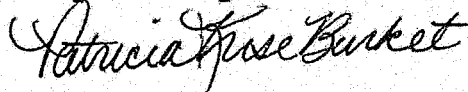
20. The information sought by the Protestants is available by alternate means. All of the EMF information referred to by the Commission in its orders and by individual Commissioners in their public statements are governmental studies or reports and journal articles, all of which are as available to the general public as they are to the Commission and its staff. Because the Commission has not contracted for any private studies to be undertaken on EMF, it is unlikely that the Commission or its staff members have any material on EMF which is available only to them and not to the general public.

#### CONCLUSION

For the foregoing reasons, the Prosecutory Staff believes that the information requested by Protestants' is not

significant, is privileged and is available through other means  
and respectfully requests that the instant Petition be denied.

Respectfully submitted,



Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: September 19, 1991

Annex A -- Objections of the Commission's  
Prosecutory Staff to Request for  
Production of Documents dated  
May 31, 1991 filed July 12, 1991.

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

---

OBJECTION OF THE COMMISSION'S  
PROSECUTORY STAFF TO REQUEST FOR  
PRODUCTION OF DOCUMENTS DATED  
MAY 31, 1991

---

The Prosecutory Staff of the Pennsylvania Public Utility Commission pursuant to Section 5.342 of the Commission's Rules of Practice and Procedure, 52 Pa. Code §5.342, raises the following objections to the Request for Production of Documents dated May 31, 1991:

1. The Prosecutory Staff objects to Request for Production of Documents No. 1 as being overburdensome and overly broad, 52 Pa. Code §5.361. The request is for all EMF studies available to the Commission. The request has no end date and may be construed to include every study conducted on EMF since the beginning of time. Moreover, every study on EMF in any language which may be lodged in the files of the Library of Congress in Washington, D.C. is theoretically available to the Commission and to anyone else including PAUSE members. This is not information which is in the Commission's exclusive control and may be discoverable by PAUSE's counsel through his own efforts. The Prosecutory Staff does not

believe that it has the duty to engage the services of a research librarian to answer this overly broad production request.

Even if the request was limited to require production of only those EMF studies which were available within the Commission, thereby available to the Prosecutory Staff itself, the time and effort needed to ferret out every available EMF study from every Commissioner and staff member represents a Herculean task that cannot be described as anything less than overburdensome.

Finally, PAUSE has the burden in this proceeding to prove how the reconductoring of the old 138 kV line will adversely affect them. It is not the Prosecutory Staff's responsibility to aid PAUSE in making its case. Moreover, the identity of the EMF studies immediately available to the Commission or to Commission Staff is irrelevant to this proceeding and not reasonably calculated to lead to discoverable material, 52 Pa. Code §5.321(b). The issue of whether PAUSE members will be adversely affected by the reconductoring of this line will be decided on the record made in this proceeding.

2. Prosecutory Staff objects to Requests for Production of Documents Nos. 3 and 4 on the identical grounds -- that they are outside the scope of discovery, requesting information which is irrelevant to this proceeding. These requests concern Commission in-house EMF workshops. Request No. 3 requests transcripts or best compilation of data presented at seminars on EMF held between 1985 and 1991, and Request No. 4 requests all documents distributed by the Commission at these seminars.

The prior knowledge on EMF of the Prosecutory Staff, the Commission Staff or the Commissioners themselves is not relevant to this proceeding as the issue of whether PAUSE members will be adversely affected by reconductoring of the 138 kV line will be decided on the record generated before the administrative law judge.

Furthermore, provision to PAUSE of the various documents provided at the workshops amounts to the Prosecutory Staff providing technical research services to the counsel for PAUSE. The information on EMF presented at the seminars was compiled by the speakers from the available literature on EMF which is available to every other expert in the field. Furthermore, PAUSE members and their area representatives were invited to these seminars by the Commission and chose not to attend. They could have picked up this material then.

The Prosecutory Staff also objects to these requests under 52 Pa. Code §5.323 because they seek to discover the Prosecutory Staff's mental impressions, conclusions and opinions involving the EMF issue in this case. The Prosecutory Staff, who does not contemplate calling an expert witness at this time, is not required to divulge its personal knowledge of EMF studies acquired by attending these seminars to aid PAUSE counsel in preparing his expert witnesses for cross-examination by the Prosecutory Staff at hearing.

3. The Prosecutory Staff objects to Request for Production of Documents No. 5 as being vague, overly broad, overburdensome and outside the scope of this proceeding, 52 Pa. Code §5.321 and

\$5.361. This request is for production of all economic studies available to the Commission relating to "the costs of adjusting electrical facilities standards to deal with EMF, and/or the potential liabilities of not avoiding EMF exposure."

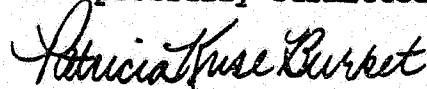
The request is vague and virtually unintelligible. There is no definition of "electrical facilities standards" nor of "potential liabilities of not avoiding EMF exposure" which might aid the Prosecutory Staff in identifying studies which might fall into this category of documents requested.

The request is also overly broad because it, like Request for Production of Documents No. 1, asks for all such studies available to the Commission, all of which would be also available to PAUSE through its own research. Again there is no end date given for this request.

The request is also overburdensome because of the effort and time which would be expended by the Prosecutory Staff in identifying, compiling and copying documents which arguably fall into the nebulous category requested given the protracted turnaround time for discovery requests discussed at the prehearing conference.

Moreover, this request is for documents which are outside the scope of this proceeding. The record was reopened in this case to allow PAUSE members to participate in a hearing solely on the issue of whether they would be adversely affected by reconductoring of this transmission line. The economic studies requested appear to involve EMP's financial impact on utilities and hence, would have no bearing on the potential effect of the line on PAUSE members, adverse or otherwise.

Respectfully submitted,



Patricia Krise Burket  
Assistant Counsel

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 12, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document on the parties listed below in the manner indicated in accordance with the requirements of 52 Pa. Code §1.54.

By First Class Mail and FAX

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

By First Class Mail

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Co.  
2301 Market Street  
Philadelphia, PA 19101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, NW  
Washington, DC 20004

ALJ Herbert Smolen  
Public Utility Commission  
1302 Philadelphia State Office Building  
Broad and Spring Garden Streets  
Philadelphia, PA 19130

*Patricia Krise Burket*

Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff for the  
Pennsylvania Public Utility  
Commission

P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 12, 1991

Annex B - Answers of the Prosecutory Staff to  
Request for Production of Documents, dated  
May 31, 1991, filed July 16, 1991

Annex B -- Answers of the Prosecutory Staff  
to Request for Production of  
Documents, dated May 31, 1991,  
filed July 16, 1991.

July 16, 1991

IN REPLY PLEASE  
REFER TO OUR FILE

Robert J. Sugarman  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

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, P.055.

Dear Mr. Sugarman:

Enclosed are the responses of the Prosecutory Staff to  
the Request for Production of Documents filed on May 31, 1991.

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

Sincerely,

*Patricia Krise Burket*

Patricia Krise Burket  
Assistant Counsel

Enclosure

cc: Jerry Rich  
(w/o enc.; w/cert.)  
Herbert S. Smolen, ALJ  
(w/o enc.; w/cert.)  
All parties of record  
(w/enc.; w/cert.)

1. All EMF studies available to the Commission.

Answer: An objection has been raised to this request.

2. Applicable safety standards for 238 kV transmission lines being constructed new in 1991.

Answer: The relevance of this request is questionable because the Woodbourne-Heaton line is being constructed to operate as a 230 kV line not a 238 kV line. However, the Prosecutory staff will answer this request. The current safety standards for all transmission lines are contained in the 1990 edition of the National Electrical Safety Code. The Woodbourne-Heaton 230 kV line is to be designed, constructed and maintained in accordance with these same safety standards. See Commission order entered February 9, 1990 at p. 3.

The 1990 edition of the National Electrical Safety Code is over 400 pages long, and is available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, N.J. 08855-1331. The Safety Code may also be available in public and university libraries.

3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985-1991.

Answer: An objection has been raised to this request.

4. All documents received and/or distributed by the Commission at EMF seminars, 1985-1991.

Answer: An objection has been raised to this request.

5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards to deal with EMF, and/or potential liabilities of not avoiding EMF exposure.

Answer: An objection has been raised to this request.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document on the parties listed below in the manner indicated:

By First Class Mail

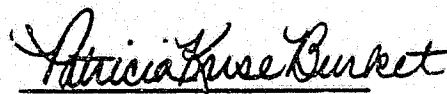
Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Co.  
2301 Market Street  
Philadelphia, PA 19101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, NW  
Washington, DC 20004

  
Patricia Krise Burket  
Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff for the  
Pennsylvania Public Utility  
Commission

P.O. Box 3265  
Harrisburg, PA 17105-3265  
(717) 783-2810

DATED: July 16, 1991

Annex C -- Prosecutory Staff's Answer to Protestants' Motion to Compel Responses, filed August 12, 1991  
(Annex A and Annex B omitted).

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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

Docket No.  
A-110550,F.055

---

PROSECUTORY STAFF'S ANSWER  
TO PROTESTANTS' MOTION TO  
COMPEL RESPONSES

---

Pursuant to 52 Pa. Code §5.342(e)(1), the Prosecutory Staff files its Answer to the Protestants' Motion to Compel Responses in the above-captioned proceeding, and avers the following:

1. On May 31, 1991, the Protestants made requests for production of documents directed to the Commission.

2. On June 26, 1991, the Prosecutory Staff entered its appearance in the above-captioned proceeding, and on July 12, 1991, filed objections to four of the Protestants' production requests on the grounds, inter alia, that they were overly broad, vague, outside the scope of discovery and overburdensome. A copy of these objections is attached as Annex A, and the arguments contained therein are incorporated by reference.

3. The Protestants' Production Requests, to which the Prosecutory Staff filed objections, read as follows:

1. All EMF studies available to the Commission.

3. Transcripts or best available compilation of data presented at Commission sponsored seminars on EMF, 1985-1991.
4. All documents received and/or distributed by the Commission at EMF seminars, 1985-1991.
5. All economic studies available to the Commission relating to the costs of adjusting electrical facilities standards to deal with EMF, and/or potential liabilities of not avoiding EMF exposure.

On July 16, 1991, the Prosecutory Staff filed its Answer to Production Request No. 2 (attached as Annex B).

4. Although the Prosecutory Staff incorporates by reference the arguments against production it already made in its objections, the Prosecutory Staff believes that there are two general points worth repeating. First, the Protestants' production requests are overly broad, making production of the requested documents burdensome. All of the documents requested are not in the exclusive possession of the Commission and may be obtained from any number of alternate sources. Therefore, it would seem that the only basis for the Protestants making a request to produce all EMF studies or all economic studies is so that the Prosecutory Staff can assist the Protestants with their research in this proceeding. Moreover, under Commission rules, participants answering interrogatories are under a continuing obligation to update their answers to interrogatories. 52 Pa. Code §5.332. This rule would seem to obligate the Prosecutory Staff to produce for the

Protestant every new document on EMF which comes into its possession or the possession of anyone else at the Commission. Were that to happen, the Prosecutory Staff would indeed become Protestants' research librarian.

Moreover, under 66 Pa. C.S. §333(d), interrogatories directed to the Commission shall be allowed only upon an order of the Commission based upon a specific finding that the interrogating party is seeking significant, unprivileged information not discoverable by alternate means. Because the requested documents on EMF are available by alternate means, a finding to the contrary cannot be made which would allow the Commission to answer this request.

The second point which need reemphasis is that the Commission's prior knowledge or present knowledge about the EMF issue is irrelevant to this proceeding because the issue will be decided on the record made in this proceeding. Furthermore, to the extent that the Prosecutory Staff's knowledge of EMF, which will be used in its cross-examination of expert witnesses in the proceeding, is gleaned from documents on EMF in its possession, these documents are protected from discovery under the broad category of "attorney work product", 52 Pa. Code §5.323. 52 Pa. Code §5.323 reads in part as follows:

**§5.323. Trial preparation material.**

(a) Generally. Subject to this subchapter, a participant may obtain discovery of any matter discoverable under §5.321(b) (relating to scope) even though prepared in anticipation of litigation or hearing by or for another participant or by or for that other participant's representative, including his attorney, consultant or agent. The discovery

shall not include disclosure of the mental impressions of a participant's attorney or his conclusions, opinions, memoranda, notes, summaries, legal research or legal theories. With respect to the representative of a participant other than the participant's attorney, discovery shall not include disclosure of his mental impressions, conclusions or opinions respecting the value or merit of a claim or defense or respecting strategy, tactics or preliminary or draft versions of written testimony or exhibits, whether or not final versions of the testimony or exhibits are offered into evidence.

In the instant case, the Prosecutory Staff's own research on EMF is comprised of notes and a file of documents on EMF -- documents which are all available to the general public. The absence of presence of any single report or study in the Prosecutory Staff's research would tend to convey to the Protestants the Prosecutory Staff's mental impressions, conclusions and opinions involving the EMF issue as well as its legal strategy. Therefore, these documents on EMF in the possession of the Prosecutory Staff fall outside the scope of discovery.

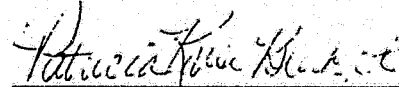
5. One final point must be made. The Prosecutory Staff finds it incredible that Protestants state that the documents requested are public documents which are subject to the "Right to Know Law" (Protestants' Motion, p. 5). While newspaper and magazine articles, journal reports and the majority of studies conducted with the use of public funds are public documents, admissible for evidentiary purposes in Commission proceedings under 52 Pa. Code §5.406, they are not "public records" subject to the "Right to Know Law", 65 P.S. §66.1. Under 65 P.S. §66.1, "public records" are defined as:

Any account, voucher or contract dealing with the receipt or disbursement of funds by an agency or its acquisition, use or disposal of services or of supplies, materials, equipment, or other property and any minute, order or decision by an agency fixing the personal or property rights, privileges, immunities, duties or obligations of any person or group of persons . . .

Clearly, EMF studies, articles or journal reports in the Commission's possession are not public records and are not subject to the ~~Commission's~~ <sup>Commonwealth's</sup> "Right to Know Law."

For the foregoing reasons, the Prosecutory Staff requests that Protestants' Motion to Compel Response of the PUC Prosecutory Staff to Request for Production of Documents be denied.

Respectfully submitted,



Patricia Krise Burket  
Assistant Counsel

Prosecutory Staff  
Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

DATED: August 12, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code §1.54.

By First Class Mail

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, N.W.  
Washington, DC 20004

Arundhati Khanwalkar, Esq.  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101

---

Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

DATED: August 12, 1991

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code §1.54.

By First Class Mail:

Robert J. Sugarman, Esq.  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107

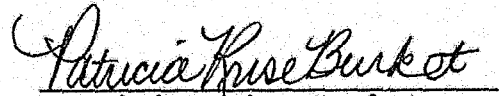
Paul R. Bonney, Esq.  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101

Tanya J. McCloskey, Esq.  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

David Rosenbaum  
Risk Analysis Corp.  
Suite 202  
6723 Whittier Avenue  
McLean, VA 22101

Ward L. Smith, Esq.  
Crowell & Moring  
1001 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004

Arundhati Khanwalkar, Esq.  
Pennsylvania Power & Light Company  
Two North Street  
Allentown, PA 19101

---

Patricia Krise Burket  
Assistant Counsel  
Prosecutory Staff

Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

DATED: September 19, 1991

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
September 19, 1991

In Re: A-110550F055

(See letter of 8/2/91)

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.

NOTICE

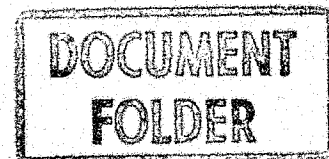
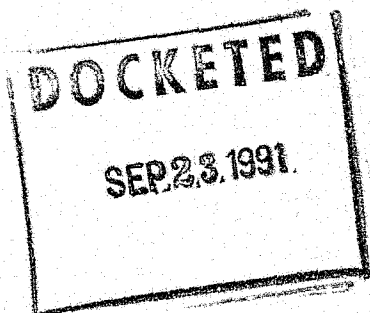
This is to inform you that the hearing now scheduled for Thursday, September 19, 1991, at 10:00 a.m., will begin at 1:00 p.m. The hearing on Friday, September 20, 1991, will begin at 10:00 a.m. as previously scheduled.

Please change your records accordingly.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

cc: Judge Smolen  
Mr. Bramson  
Bur. of Safety/Compliance  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested



NVL

APPEARANCE SHEET

ALJ HEARING REPORT

PAY

DOCKET NO. A-110550F055  
 CASE NAME Philadelphia Electric Co., etc.  
 HEARING LOCATION Philadelphia, PA.  
 HEARING DATE Sept. 6, 1991  
 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 (F)  
 RECORD CLOSED YES  NO   
 Briefs to be filed YES  NO   
 BENCH DECISION YES  NO

RECEIVED  
 SEP 24 1991  
 Office of A. L. J.  
 Public Utility Commission

DOCKETED  
 SEP 23 1991

REMARKS: (F) Schedule previously established

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
 PLEASE PRINT CLEARLY  
 INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
Patricia Krise Burket Telephone No. (717) 783-2810	P.O. Box 3265 City: Harrisburg State: PA Zip: 17105-3265	Commission Prosecutory Staff
TANYA J. McCloskey Telephone No. (717) 783-5048	1425 Strawberry Sq. City: Hbg State: PA Zip: 17120	Office of Consumer Advocate
PAUL R. Bonney Telephone No. (215) 241-4352	230 Market Street City: Phila State: PA Zip: 19101	Philadelphia Electric Company

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

Robert J. Stankow (inc.)  
 Reporter

Arundhati Khanwalkar address Two North North St.

PP&L

City	State	Zip
Allentown	Pa.	18101

Telephone No. (215) 774-4452

Robert J Sugarman

Address		
101 N Broad		

City	State	Zip
Blair	Pa.	19107

Telephone No. (215) 751-9733

WARD L. SMITH

Address		
1001 Pa Ave NW		

Ph. k Etc. Co.

City	State	Zip
Washgton	DC	20004

Telephone No. (215) 624-2554

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

Address		
---------	--	--

City	State	Zip
------	-------	-----

Telephone No. ( )

APPEARANCE SHEET

ALJ HEARING REPORT

DOCKET NO. A-119550F055  
 CASE NAME Letter of Notification -  
Woodbine-Heaton 230 kv line  
 HEARING LOCATION Philadelphia, PA  
 HEARING DATE September 19, 20, 1991  
 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 7  
 RECORD CLOSED YES  NO   
 Briefs to be filed YES  NO   
 BENCH DECISION YES  NO

REMARKS  SCHEDULE PREVIOUSLY  
ESTABLISHED

**RECEIVED**

SEP 24 1991

Office of A. L. J.  
 Public Utility Commission

**DOCKETED**

SEP 27 1991

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
 PLEASE PRINT CLEARLY  
 INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
* Patricia Krise Burket Telephone No. (717) 783-2810	P.O. Box 3265 North Office Bldg. Rm. G-30 City: HBG State: PA Zip: 17105	Prosecutory Staff
* TANYA J. McCLOSKEY Telephone No. (717) 783-5048	1425 Strawberry Sq City: Hbg State: PA Zip: 17120	office of Consumer Advocate
* PAUL R. DENNEY Telephone No. (215) 541-4120	City: Phila State: PA Zip: 19101	Philadelphia Electric Co.

CHECK THIS BOX IF ADDITIONAL PARTIES  
 OR COUNSEL OF RECORD APPEAR ON BACK.

**FOLDER**

Robert D. Stronben (inc)  
 Reporter

x WARD SMITH

Address		
1001 Pa. Ave NW		
City	State	Zip
Wash	DC	20004

Phila. Elec  
Co.

Telephone No. (202) 624-2594

x Tom Watson

Address		
1001 Pa. Ave. NW		
City	State	Zip
Wash	DC	20004

Phila Elec  
Co.

Telephone No. 202, 624-2510

x A. Khanwalkar

Address		
Two North Ninth St.		
City	State	Zip
Allentown	PA	18101

PP&L

Telephone No. (215) 774-4452

x R Suggsman  
AM Kaplan

Address		
101 N. Broad St		
City	State	Zip
Phila	Pa	19107

Protestants

Telephone No. (215) 781-9733

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
September 25, 1991

In Re: A-110550F055

(See letter of 9/19/91)

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.

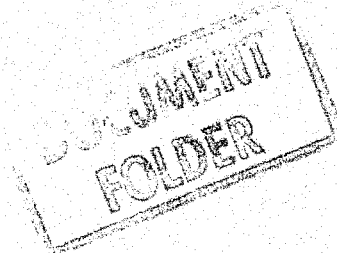
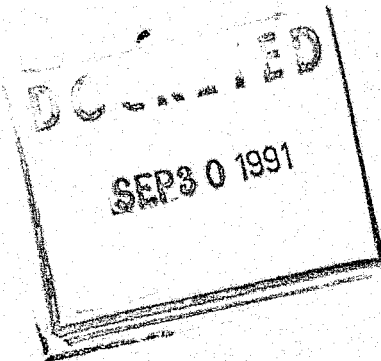
NOTICE

This is to inform you that at the request of Administrative Law Judge Herbert Smolen, the further hearing now scheduled to be held on Thursday, September 26, 1991, at 10:00 a.m., in the subject proceeding has been cancelled.

Please change your records accordingly.

cc: Judge Smolen  
Mr. Bramson  
Consumer Advocate  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested &  
Reg. Mail to Complainant



11/11

APPEARANCE SHEET

2745

ALJ HEARING REPORT

DOCKET NO. A-110550F055

CASE NAME Philadelphia Electric Co.

HEARING LOCATION Philadelphia, PA.

HEARING DATE Sept. 26, 1991

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 Cancelled

DOCUMENT FOLDER

RECEIVED

SEP 3 0 1991

Office of A. L. J.  
Public Utility Commission

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
PLEASE PRINT CLEARLY  
INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS			APPEARING FOR
Telephone No. ( )	City	State	Zip	
Telephone No. ( )	City	State	Zip	
Telephone No. ( )	City	State	Zip	

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

Reporter

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
October 1, 1991

In Re: A-110550F055

(See letter of 9/25/91)

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.

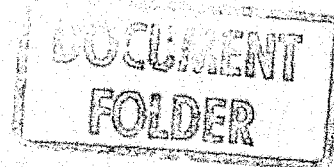
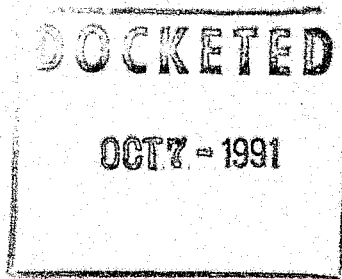
NOTICE

This is to inform you that the further hearings now scheduled to be held on Wednesday, October 2, 1991 and Friday, October 11, 1991, in the subject proceeding have been cancelled.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

cc: Judge Smolen  
Mr. Bramson  
Bur. of Safety/Compliance  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested



10/1/91

# PHILADELPHIA ELECTRIC COMPANY

## LEGAL DEPARTMENT

James W. Durham  
Senior Vice President  
and General Counsel

Eugene J. Bradley  
Of Counsel

Bjamie R. Anderson  
Legal Administrator

2301 MARKET STREET, BOX 8699  
PHILADELPHIA, PA 19101  
(215) 841-5544 FAX: 568-3389

Donald Blanken  
Paul R. Bonney  
Ellen M. Cavanaugh  
Rudolph A. Chillemi  
Edward J. Cullen, Jr.  
Katherine K. Dodd  
Aubra S. Gaston  
Gregory Golazeski  
E. C. Kirk Hall  
Elizabeth P. Harris  
J. Lindsay Johnston  
Kimberly Lewis  
Stephanie Whitton Lewis  
T. Michael Mather  
Mary R. McFall  
Jenny P. Shulbank  
Assistant General Counsel

October 4, 1991

### BY HAND DELIVERY

Honorable Herbert S. Smolen  
Administrative Law Judge  
Pennsylvania Public Utility Commission  
1302 Philadelphia State Office Building  
Broad & Spring Garden Streets  
Philadelphia, PA 19130

RECEIVED  
OCT 7 1991

SECRETARY'S 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 Judge Smolen:

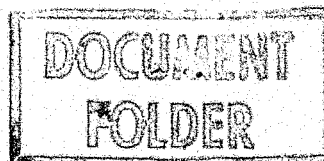
Enclosed in accordance with 66 Pa.C.S. § 333(b) and (f) and 52 Pa. Code §§ 5.343, 5.344 and 5.349 is Philadelphia Electric Company's Notice of Deposition of Protestants' Witness Dr. Abraham R. Liboff. Attached to the Notice, in accordance with 52 Pa. Code § 5.344(a), is a proposed Order which we request that you enter.

If you have any questions regarding this Notice, please call me at 841-4252.

Sincerely,

*Paul R. Bonney*  
Paul R. Bonney

cc: Jerry Rich, Secretary  
All Parties of Record



BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF :  
PHILADELPHIA ELECTRIC COMPANY :  
RELATIVE TO RECONSTRUCTING AND :  
REBUILDING OF THE EXISTING : DOCKET NO. A-110550,F.055  
138 KV LINE TO OPERATE AS A :  
WOODBOURNE-HEATON 230 KV LINE :  
IN MONTGOMERY AND BUCKS COUNTIES :

---

NOTICE OF DEPOSITION OF  
PROTESTANTS' WITNESS DR. ABRAHAM R. LIBOFF

---

RECEIVED  
OCT 7 1991  
SECRETARY'S OFFICE  
Public Utility Commission

Philadelphia Electric Company ("PECO"), pursuant to 66 Pa.C.S. § 333(b) and (f) and 52 Pa. Code §§ 5.343, 5.344 and 5.349, files this Notice of Deposition of the Protestants' Witness Dr. Abraham R. Liboff, Professor of Physics at Oakland University in Rochester, Michigan, and states as follows:

1. On September 3, 1991, the Protestants served copies of the written Direct Testimony by Dr. Abraham R. Liboff in this proceeding.

2. On September 6, 1991, PECO served Interrogatories and Requests for Production of Documents and Data (Set II) with respect to Dr. Liboff's pre-filed testimony.

DOCUMENT  
FOLDER

DOCKETED  
OCT 8 1991

3. During an off-the-record conference call on September 24, 1991 during which the parties and Administrative Law Judge Smolen (the "ALJ") discussed PECO's Interrogatories and Requests for Production of Documents to the Protestants (Set II), the parties (in particular PECO and the Protestants) agreed that PECO would take the deposition of Dr. Liboff.

4. The Protestants and PECO have scheduled Dr. Liboff's deposition for 9:30 a.m. on October 9, 1991 in Birmingham, Michigan.

5. At the deposition, PECO intends to inquire into statements made in and matters related to the pre-filed Direct Testimony of Dr. Liboff.

6. Pursuant to 66 Pa.C.S. § 333(f) and 52 Pa. Code §§ 5.343(d) and 5.349, PECO requests that Dr. Liboff produce at the taking of the deposition the following documents in his possession, custody, or control. Pursuant to 52 Pa. Code §§ 5.343(d) and 5.349(c), PECO specifies individual items that are requested. Pursuant to 52 Pa. Code §§ 5.343(d) and 5.349(a), PECO requests that Dr. Liboff produce original documents to be inspected and copied by PECO.

- a. A current copy of Dr. Liboff's curriculum vitae.
- b. To the extent not identified in Dr. Liboff's current curriculum vitae, a copy of all publications

referred to by Dr. Liboff on page 5 of his testimony in his statement that: "We have since carried out dozens of other experiments designed around this ICR hypothesis, in diatoms, in human lymphocytes, in embryonic chick, in rabbits, in yeast, and in bacteria." If any research referred to in this statement is not available in published form, please produce all data reporting the results of that research.

c. To the extent not identified in Dr. Liboff's current curriculum vitae, a copy of all publications referred to by Dr. Liboff on page 6 of his testimony in his statement that: "A second area worth noting in connection with ion cyclotron resonance involves our work on exposing human lymphocytes to calcium-tuned magnetic fields, which resulted in profound changes in calcium uptake." If any research referred to in this statement is not available in published form, please produce all data reporting the results of that research.

d. All data reporting the results of Dr. Liboff's research referred to in his statement on page 6 of his testimony that: "Less than a year ago I began a new series of experiments, aimed at examining the effects of weak ELF resonance exposures on human cancer cell lines, notably human lymphomas."

e. All data reporting the results of Dr. Liboff's research referred to in his statement on page 6 of his

testimony that: "[T]his was a more complete follow-up of earlier, unpublished work I had done with a colleague from the National Cancer Institute when I was on sabbatical at the Naval Medical Research Institute. We had found at that time (about 1985) that mouse myeloma and lymphoma cells indicated extraordinarily high rates of proliferation in ELM magnetic fields."

f. All data reporting the results of Dr. Liboff's research referred to in his statement on page 6 of his testimony that: "My most recent results on human lymphoma cells, to be presented at the Department of Energy contractors meeting in November of 1991, reaffirm these results but also find that the degree of proliferation in 60 Hz magnetic fields is closely dependent on the local geomagnetic intensity, rising and falling sharply in the vicinity of certain cyclotron resonance points."

g. A copy of all correspondence related to the device referred to on page 5 of Dr. Liboff's testimony as "now in the final stages of FDA approval."

h. A copy of the application filed with the FDA for the device referred to on page 5 of Dr. Liboff's testimony in his statement that: "[W]e managed to obtain a series of patents involving both the basic concept and a number of medical applications, one of which . . . has led to a device which is now in the final stages of FDA approval."

i. If an application for an Investigational Device Exemption was submitted to the Food and Drug Administration for the device referred to on page 5 of Dr. Liboff's testimony, please provide a copy of that application.

j. If an Investigational Device Exemption was granted for the device referred to on page 5 of Dr. Liboff's testimony, please provide a copy of that approval.

k. If any clinical trials have been conducted for the device referred to on page 5 of Dr. Liboff's testimony, please provide the data reporting the results of those clinical trials.

l. All publications, documents, studies, notes, bibliographic lists, or other written materials reviewed by Dr. Liboff in preparation for or during the drafting of his written testimony.

m. A syllabus for each course taught by Dr. Liboff in the last 12 months, including courses being taught during the current semester.

7. Pursuant to 66 Pa.C.S. § 333(f) and 52 Pa. Code §§ 5.343(d) and 5.349, PECO requests that Dr. Liboff produce at the taking of the deposition the following documents in his possession, custody, or control. Pursuant to 52 Pa. Code §§ 5.343(d) and 5.349(e), PECO specifies individual items that are requested. Pursuant to 52 Pa. Code §§ 5.343(d) and 5.349(a),

PECO requests that Dr. Liboff produce original documents to be inspected and copied by PECO. For purposes of this paragraph 7 only, if Dr. Liboff does not have the requested documents in his possession, control, or custody, please provide any document in Dr. Liboff's possession, custody, or control that identifies the author of the document, the journal in which the document appeared, the date on which the document was published, and/or the journal/document citation for the document. For purposes of this paragraph 7 only, if any of the materials requested are contained in files or compilations of materials which would make it unduly burdensome to identify the specific documents requested, Dr. Liboff may at the time of the deposition produce or make available for inspection and copying, in lieu of the specific requested documents, the files or compilations of materials in which the requested documents are contained.

a. The published evidence referred to by Dr. Liboff on page 4 of his testimony in his statement that: "Some supporting parallel evidence has been published indicating that embryological changes occur in both chick eggs and in fish eggs following exposure to weak ELF magnetic fields."

b. Publications reporting the results of the research referred to by Dr. Liboff on page 6 of his testimony in his statement that: "This approach was adopted and greatly extended at the Lawrence Berkely Laboratory by Dr. Jan Wallaczek, who recently joined Dr. Ross Adey's group in Loma Linda."

c. The manuscript referred to by Dr. Liboff on page 6 of his testimony in his statement that: "Parola now has a manuscript in preparation comparing the three sets of data, showing that for any given rate of proliferation in normal cells exposed to weak ELF fields, the turnover is much greater in cancer cells."

d. The publications reporting the results of the research referred to by Dr. Liboff on page 6 of his testimony in his statement that: "I learned later that two other investigators, Dr. Wendell Winters of the University of Texas, and Dr. Abe Parola, of Ben-Gurion University, working independently of me and of each other had seen the same effect."

e. Publications reporting the epidemiological data referred by Dr. Liboff on page 5 of his testimony that his statement that: "There is also a hazard to humans. This opinion is based upon my gradual acceptance of the epidemiological data, with each new report strengthening the ones before it."

f. The publication containing the assertion referred to by Dr. Liboff on page 5 of his testimony in his statement that: "Dr. Russell Reiter, of the University of Texas, looking at the magnetically-induced changes in melatonin output by the pineal gland, has asserted that at least some sleep disorders should be regarded as caused by the electromagnetic environment."

g. The publications referred to by Dr. Liboff on page 5 of his testimony in his statement that: "Graham and Cohen have reported evidence of changes in human heartbeat in a group of men exposed to 60 Hz magnetic fields for short periods of time."

h. The publications relied upon by Dr. Liboff for his statement on page 3 of his testimony that: "Indeed every positive study, and there is a preponderance of positive studies, has been severely criticized in ways suggesting that if the likelihood of interactions was more reasonable, the statistics would be more acceptable. There has resulted a sort of hysterical, non-scientific evaluation of this epidemiological data, in which critics spend a lot of energy searching out minute disparities between study A and study B, giving uncritical emphasis to a very few earlier negative studies, arguing interminably about 'cause and effect', (a non sequitur in that epidemiology never establishes casual relationships) and searching for confounding factors or hidden variables to explain away these unpleasant correlations -- all because it's not easy to show how weak magnetic fields can interact with tissue."

i. Publications or other documents reporting the results of the society meetings referred to by Dr. Liboff on pages 2-3 of his testimony in his statement that: "Further, each new meeting of the societies I mentioned above provides

more and more evidence of the fact that biological systems are somehow affected by ultralow electromagnetic intensities."

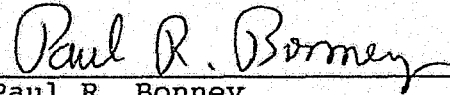
j. All materials identifying the "electromagnetic procedures" referred to by Dr. Liboff on page 1 of his testimony in his statement that: "Over the years, electromagnetic procedures developed along these lines have become recognized clinical techniques for treating certain types of bone problems."

k. To the extent not produced in response to any previous request, all other publications, studies, or other documents reporting the results or identifying research relied upon by Dr. Liboff for his opinions and conclusions as stated in his testimony.

8. In accordance with 52 Pa. Code § 5.348, PECO will make arrangements to have a court reporter transcribe Dr. Liboff's deposition. PECO will instruct the person transcribing the deposition to send a copy of the transcript by registered mail to Secretary Rich in accordance with 52 Pa. Code § 5.348(d). If other parties desire copies of the transcript, the court reporter will furnish those copies pursuant to 52 Pa. Code § 5.348(f).

9. Attached to this Notice of Deposition is a proposed Order in accordance with 52 Pa. Code § 5.344(a), which Order PECO requests that the ALJ enter.

Respectfully submitted,



---

Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street, S23-1  
Philadelphia, PA 19101  
(215) 841-4252

Dated: October 4, 1991

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

LETTER OF NOTIFICATION OF :  
PHILADELPHIA ELECTRIC COMPANY :  
RELATIVE TO RECONSTRUCTING AND :  
REBUILDING OF THE EXISTING : DOCKET NO. A-110550,F.055  
138 KV LINE TO OPERATE AS A :  
WOODBOURNE-HEATON 230 KV LINE :  
IN MONTGOMERY AND BUCKS COUNTIES :

ORDER

Philadelphia Electric Company's application for approval to  
take the deposition of Protestants' Witness Dr. Abraham R. Liboff  
is GRANTED. So ORDERED this \_\_\_\_\_ day of October, 1991.

---

HERBERT SMOLEN  
Administrative Law Judge

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54.

By Hand Delivery

Honorable Herbert S. Smolen  
Administrative Law Judge  
Pennsylvania Public Utility Commission  
1302 Pennsylvania State Office Building  
Broad & Spring Garden Streets  
Philadelphia, PA 19130

Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107  
(Counsel for Intervenors)

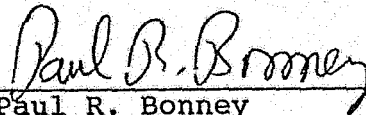
By Telecopy and First Class Mail

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

(Continued)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101



---

Paul R. Bonney  
Assistant General Counsel,  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: October 4, 1991

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
October 7, 1991

In Re: A-110550F055

(See letter dated 10/1/91)

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.

NOTICE

This is to inform you that in addition to the hearings scheduled by Administrative Law Judge Smolen's July 18, 1991 prehearing order, the following hearings on the above captioned case will be held as follows, all commencing at 10:00 a.m., in Room 1306, Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania:

Tuesday & Wednesday, October 15 & 16, 1991  
Monday, Tuesday & Wednesday, October 28, 29 & 30, 1991

Please change your records accordingly.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

cc: Judge Smolen  
Mr. Bramson  
Bur. of Safety/Compliance  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested

**DOCKETED**  
**OCT 11 1991**

**DOCUMENT  
FOLDER**

**NVL**

APPEARANCE SHEET

*RAY*

ALJ HEARING REPORT

DOCKET NO. A-110550F055

CHECK THOSE BLOCKS WHICH APPLY:

CASE NAME Letter of Notification of  
Philadelphia Electric Company

Hearing held YES  NO

Testimony taken YES  NO

Hearing concluded YES  NO

HEARING LOCATION Philadelphia, PA.

Further hearing needed YES  NO

HEARING DATE Oct. 2, 1991

Estimated add'l days \_\_\_\_\_

ALJ Smolen

RECORD CLOSED YES  NO

Briefs to be filed YES  NO

BENCH DECISION YES  NO

**RECEIVED**  
**OCT 09 1991**  
Office of A. L. J.  
Public Utility Commission

REMARKS: \_\_\_\_\_

*Henry Cavallero*

DOCUMENT  
FOLDER

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
PLEASE PRINT CLEARLY  
INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS			APPEARING FOR
	City	State	Zip	
Telephone No. ( )				
Telephone No. ( )				
Telephone No. ( )				

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

Reporter \_\_\_\_\_

# PHILADELPHIA ELECTRIC COMPANY

## LEGAL DEPARTMENT

James W. Durham  
Senior Vice President  
and General Counsel

Eugene J. Bradley  
Of Counsel

Sjarnie R. Anderson  
Legal Administrator

2301 MARKET STREET, BOX 8699  
PHILADELPHIA, PA 19101  
(215) 841-5544 FAX: 568-3389

Donald Blanken  
Paul R. Bonney  
Ellen M. Cavanaugh  
Rudolph A. Chillemi  
Edward J. Cullen, Jr.  
Katherine K. Dodd  
Aubra S. Gaston  
Gregory Golazeski  
E. C. Kirk Hall  
Elizabeth P. Harris  
J. Lindsay Johnston  
Kimberly Lewis  
Stephanie Whilton Lewis  
T. Michael Mather  
Mary R. McFall  
Jenny P. Shulbank  
Assistant General Counsel

**DOCKETED**

**OCT 16 1991**

October 8, 1991

### BY HAND DELIVERY

Honorable Herbert S. Smolen  
Administrative Law Judge  
Pennsylvania Public Utility Commission  
1302 Pennsylvania State Office Building  
Broad & Spring Garden Streets  
Philadelphia, PA 19130

**RECEIVED**  
OCT 11 1991

**SECRETARY'S 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 Judge Smolen:

This letter confirms the agreement of the parties -- in particular, Philadelphia Electric Company ("PECO") and the Protestants -- that PECO will take the deposition of Protestants' witness Dr. Liboff at 9:30 a.m. on October 9, 1991 in Birmingham, Michigan. At the deposition, PECO will inquire into statements made in and matters related to the pre-filed testimony of Dr. Liboff in this proceeding.

PECO's agreement to take the deposition of Dr. Liboff does not constitute the waiver of any of PECO's other rights to obtain discovery from the Protestants under the Pennsylvania Public Utility Code or the Regulations of the Pennsylvania Public Utility Commission.

Sincerely,

*Paul R. Bonney*  
Paul R. Bonney

**DOCUMENT  
FOLDER**

~~cc: Jerry Rich, Secretary~~  
See Certificate of Service

**NRD**

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the parties and in the manner indicated below in accordance with the requirements of 52 Pa. Code § 1.54.

By Hand Delivery

Honorable Herbert S. Smolen  
Administrative Law Judge  
Pennsylvania Public Utility Commission  
1302 Pennsylvania State Office Building  
Broad & Spring Garden Streets  
Philadelphia, PA 19130

By Telecopy and First Class Mail

Robert J. Sugarman, Esquire  
Sugarman & Associates  
16th Floor, City Place  
101 North Broad Street  
Philadelphia, PA 19107  
(Counsel for Intervenors)

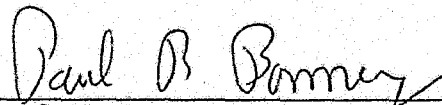
By First Class Mail

Tanya J. McCloskey, Esquire  
Assistant Consumer Advocate  
Office of Consumer Advocate  
1425 Strawberry Square  
Harrisburg, PA 17120

Patricia Krise Burket, Esquire  
Pennsylvania Public Utility Commission  
G-28, North Office Building  
P.O. Box 3265  
Harrisburg, PA 17120

(Continued)

Tinku Khanwalkar, Esquire  
Pennsylvania Power & Light Co.  
Two North Ninth Street  
Allentown, PA 19101



---

Paul R. Bonney  
Assistant General Counsel  
Philadelphia Electric Company  
2301 Market Street  
Philadelphia, PA 19101  
(215) 841-4252

Dated: October 8, 1991

CONRAIL

ORIGINAL

October 11, 1991

Commonwealth of Pennsylvania  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

RECEIVED  
OCT 15 1991

SECRETARY'S OFFICE  
Public Utility Commission

SUBJECT: A-110550F055

Gentlemen:

Reference is made to your notice dated October 7, 1991, regarding hearings for the Subject case addressed to C. E. Wogan.

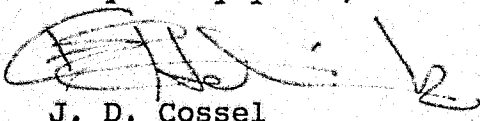
Please be advised that Mr. Wogan has retired and all future notifications should be addressed as follows:

J. D. Cossel  
Consolidated Rail Corporation  
Room 1200  
15 North 32nd Street  
Philadelphia, PA 19104

Thankyou for your cooperation.

RECORDED  
OCT 21 1991

Very truly yours,

*JDC*  
  
for  
J. D. Cossel  
Chief Engineer  
Design and Construction

Room 1200 - (215) 596-3600

DOCUMENT  
FOLDER

COMMONWEALTH OF PENNSYLVANIA  
PENNSYLVANIA PUBLIC UTILITY COMMISSION  
P.O. BOX 3265, HARRISBURG, PA 17105-3265  
October 21, 1991

RLS

In Re: A-110550F055

(See letter of 10/7/91)

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.

NOTICE

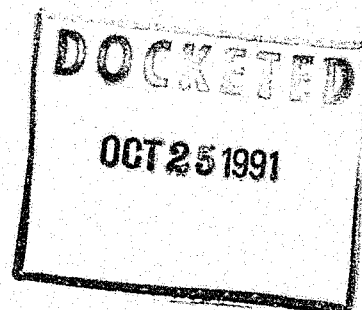
This is to inform you that the further hearings now scheduled to be held on Monday, Tuesday and Wednesday, October 28, 29 and 30, 1991, at 10:00 a.m., in the subject proceeding has been changed to Tuesday, Wednesday and Friday, November 19, 20 & 22, 1991 and Monday and Tuesday, December 16 and 17, 1991, all hearings will begin at 10:00 a.m.

Please change your records accordingly.

The presiding officer in this proceeding is Administrative Law Judge Herbert Smolen. Judge Smolen can be contacted at 1302 Philadelphia State Office Building, Broad and Spring Garden Streets, Philadelphia, Pennsylvania 19130; telephone (215) 560-2105.

cc: Judge Smolen  
Mr. Bramson  
Bur. of Safety/Compliance  
Law Bureau  
Ms. Kelly  
Mrs. Howell  
Docket Room

Certified Mail  
Receipt Requested



APPEARANCE SHEET

ALJ HEARING REPORT

DOCKET NO. A-110550F055  
CASE NAME Letter of Notification of  
Philadelphia Electric Company, etc.  


---

HEARING LOCATION Philadelphia, PA.  
HEARING DATE Oct. 11, 1991  
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

**RECEIVED**  
**FOLDER**

REMARKS: Hearing Cancelled

**RECEIVED**

**OCT 22 1991**

**RLS**

Office of A. L. J.  
Public Utility Commission

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
PLEASE PRINT CLEARLY  
INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS			APPEARING FOR
	City	State	Zip	
Telephone No. ( )				
Telephone No. ( )				
Telephone No. ( )				

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

Reporter \_\_\_\_\_

APPEARANCE SHEET

ALJ HEARING REPORT

DOCKET NO. A-110550F055  
CASE NAME Letter of Notification of  
Philadelphia Electric Company  
HEARING LOCATION Philadelphia, PA.  
HEARING DATE Oct. 15, 1991  
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 Schedule established

RECEIVED  
OCT 22 1991  
Office of A. L. J.  
Public Utility Commission

RLS

DOCKETED  
OCT 25 1991

DOCKET  
FOLDER

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
PLEASE PRINT CLEARLY  
INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
Paul R. Bonney Telephone No. (202) 811-4352	2301 Market St. 323-1 City: Phila. State: PA Zip: 19101	Philadelphia Electric Co.
Tom Watson Telephone No. (202) 624-2510	1001 Pa. Ave NW City: Wash State: DC Zip: 20004	Philadelphia Electric Co.
WARD SMITH Telephone No. (202) 624-2596	1001 Pa Ave NW City: Wash State: DC Zip: 20004	Ph. Co. Elec. Co.

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.



Arthur J. Stoner (Jr.)  
Reporter

Patricia Krise Burket

Address P.U.C.  
PO Box 3265

Law Bureau  
Prosecutory Staff

Telephone No. (717) 783-2810

City	State	Zip
Harrisburg	PA	17120

Arundhati Khanwalkar

Address PPA  
2 North Ninth Street

PPA/C

Telephone No. (215) 474-4452

City	State	Zip
Allentown	PA	18101

TANYA J. McCLOSKEY  
Dianne E. DUSMAN

Address  
1425 Strawberry Sq.

Office of  
Consumer Advocate

Telephone No. ( )

City	State	Zip
Hbg	PA	17120

Robert J Sugarman

Address  
101 N Broad

Protestants

Telephone No. (717) 751-9773

City	State	Zip
Blm	PA	19107

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

Telephone No. ( )

Address		
City	State	Zip

APPEARANCE SHEET

ALJ HEARING REPORT

DOCKET NO. A-110550F055

CHECK THOSE BLOCKS WHICH APPLY:

CASE NAME Letter of Notification of

Hearing held YES  NO

Philadelphia Electric Company

Testimony taken YES  NO

HEARING LOCATION Philadelphia, PA.

Hearing concluded YES  NO

HEARING DATE Oct. 16, 1991

Further hearing needed YES  NO

ALJ Smolen

Estimated add'l days X

RECORD CLOSED YES  NO

Date \_\_\_\_\_

Briefs to be filed YES  NO

Date \_\_\_\_\_

BENCH DECISION YES  NO

REMARKS: Scheduled & stalled

**RECEIVED**

OCT 22 1991

Office of A. L. J.  
Public Utility Commission  
RLS

OCT 25 1991

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF PARTIES OR COUNSEL OF RECORD  
PLEASE PRINT CLEARLY  
INCOMPLETE INFORMATION MAY RESULT IN DELAY OF PROCESS

NAME and TELEPHONE NUMBER	ADDRESS	APPEARING FOR
WARD SMITH Telephone No. (202) 624-2574	1001 P. Ave NW City Wash. State DC Zip 20009	Phila. Elec. Co.
Paul Bonney Telephone No. (215) 841-4821	2301 Marlot St. City Phila State PA Zip 19101	Phila. Elec. Co.
Patricia Krise Burkett Telephone No. (717) 783-2810	P.O. Box 3265 City Harrisburg State PA Zip 17112	PUC Law Bureau Prosecutory Staff

CHECK THIS BOX IF ADDITIONAL PARTIES OR COUNSEL OF RECORD APPEAR ON BACK.

Will J. [Signature]  
Reporter

Tom Watson  
Crowell & Moring

Address  
1201 Pa Ave NW

Phila Elec.

Telephone No. 202,624-2510

City State Zip  
Wash DC 20004

Jesse A. Dillon  
PP+L

Address  
Two North Ninth St.

PP+L

Telephone No. ( )

City State Zip  
Allentown PA 18101

Tanya McCLOSKEY  
Dianne Dusman

Address  
1425 Strawberry Sq

Office of  
Consumer  
Advocate

Telephone No. (717)783-5048

City State Zip  
Hog PA 17120

Robert Sengman

Address  
101 N Broad

*Robert Sengman*

Telephone No. (215)751-7733

City State Zip  
Phila Pa 19107

Telephone No. ( )

Address  
City State Zip

Telephone No. ( )

Address  
City State Zip

Telephone No. ( )

Address  
City State Zip

Telephone No. ( )

Address  
City State Zip

Telephone No. ( )

Address  
City State Zip

Telephone No. ( )

Address  
City State Zip