CAPTION SHEET CASE MANAGEMENT SYSTEM

1. REPORT DATE: 00/00/00		
2. BUREAU: FUS		
3. SECTION(S):	4. PUBLIC MEETING DATE:	
5. APPROVED BY:		00/00/00
DIRECTOR:		
SUPERVISOR:		
6. PERSON IN CHARGE:	7. DATE FILED:	03/15/06
8. DOCKET NO: A-110500 F0375	9. EFFECTIVE DATE:	00/00/00

PARTY/COMPLAINANT: 230 KV LINE MODIFICATION, DERRY TWP.

RESPONDENT/APPLICANT: PPL ELECTRIC UTILITIES CORP

COMP/APP COUNTY: MONTOUR UTILITY CODE: 110500

ALLEGATION OR SUBJECT

LETTER OF NOTIFICATION OF PPL ELECTRIC UTILITIES CORPORATION FILED PURSUANT TO 52 PA CODE CHAPTER 57 SUBCHAPTER G WITH RESPECT TO MONTOUR-SUNBURY 230 KV LINE AND THE MONTOUR-COLUMBIA 500/230 KV LINE MODIFICATION IN DERRY TOWNSHIP, MONTOUR COUNTY.

POST & SCHELL PC
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John H. Isom

jisom@postschell.com
717-612-6032 Direct

March 15, 2006

VIA HAND DELIVERY

ORIGINAL

James J. McNulty
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
PO Box 3265
Harrisburg, PA 17105-3265

RECEIVED
2006 MAR 15 PM 4:21
PA PUC
SECRETARY'S BUREAU

RE: Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 51 Pa. Code Chapter 57 Subchapter G with Respect to Montour-Sunbury 230 kV Line Modification in Derry Township, Montour County - Docket No. A- 110500 F0375

Dear Secretary McNulty:

Enclosed, for filing, are an original and three (3) copies of the Letter of Notification of PPL Electric Utilities Corporation in the above-referenced proceeding. As indicated on the enclosed certificate of service, copies have been served on the parties in the manner indicated.

Respectfully submitted,

John H. Isom

JHI/jl
Enclosures
cc: Certificate of Service

DOCKETED
MAR 20 2006

DOCUMENT FOLDER

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Letter of Notification has been served upon the following persons, in the manner indicated, in accordance with the requirements of § 1.54 (relating to service by a participant).

VIA FIRST CLASS MAIL

Pennsylvania Historical and Museum Commission
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0053
ATTN: Mr. Douglas C. McLearen, Chief

Pennsylvania Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, PA 17120
ATTN: Honorable Allen D. Biehler, P.E. Secretary

Department of Environmental Protection
P.O. Box 2063
Market Street State Office Building
Harrisburg, PA 17105-2063
ATTN: Office of Field Operations

Montour County Commissioners
Montour County Courthouse
29 Mill Street
Danville, PA 17821
ATTN: Mr. Harold Hurst

Derry Townshp Supervisors
909 Shed Road
Danville, PA 17821
ATTN: Mr. David McCollum, Chairman

Montour County Planning Commission
112 Woodbine Lane
Danville, PA 17821
ATTN: Ms. Betsy Hack

Northern Montour Regional Planning Commission
909 Shed Road
Danville, PA 17821
ATTN: Kenneth Mertz, Chair

Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1923

Office of Small Business Advocate
Commerce Building
300 North Second Street, Suite 1102
Harrisburg, PA 17101

Office of Trial Staff
PO Box 3265
Commonwealth Keystone Building
400 North Street, 2nd Floor West
Harrisburg, PA 17105-3265

Date: March 15, 2006

John H. Isom

ORIGINAL

RECEIVED

2006 MAR 15 PM 4:21

PA PUC
SECRETARY'S BUREAU

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Re: Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G With Respect To Montour-Sunbury 230 kV Line and the Montour-Columbia 500/230 kV Line Modification in Derry Township, Montour County	:	Docket No. A- 110500 F0375

LETTER OF NOTIFICATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

1. This Letter of Notification is filed by PPL Electric Utilities Corporation ("PPL Electric"), pursuant to 52 Pa. Code §57.72(d)(1), to request the Pennsylvania Public Utility Commission's ("Commission") approval for the replacement of one existing 110 foot steel pole with one 180 foot steel pole in order to raise the adjacent two spans of transmission lines. The purpose of this project is to permit PPL Montour, LLC, which owns and operates the coal fired Montour Steam Electric Station ("SES") in Derry Township, Montour County, to construct on its own property transmission lines that are required to power new pollution control equipment at the Montour SES.

2. Accompanying this Letter of Notification is a separately bound volume containing Exhibits A-C and Appendices A-D, which provide additional information about the project. This Letter of Notification and the accompanying Exhibits and Appendices, which are incorporated herein by reference, contain all of the information required by 52 Pa. Code § 57.72(d)(4).

3. The name and address of the Applicant are:

PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, Pennsylvania 18101

DOCUMENT FOLDER

DOCKETED

MAR 20 2006

4. PPL Electric is a Pennsylvania corporation, which provides electric distribution and provider of last resort electric supply services, subject to the Commission's regulatory jurisdiction, to approximately 1.3 million customers in all or portions of twenty-nine counties in eastern and central Pennsylvania.

5. The names, addresses and telephone numbers of PPL Electric's attorneys are:

David B. MacGregor
Post & Schell, P.C.
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103-2808
Voice: 215.587.1197
Fax: 215.587.1444
E-mail: dmacgregor@postschell.com

John H. Isom
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17 North Second Street
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E-mail: jisom@postschell.com

Paul E. Russell
PPL Electric Utilities Corporation
Two North Ninth Street
Allentown, Pennsylvania 18101
Voice: 610.774.4254
Fax: 610.774.6726
E-mail: perussell@pplweb.com

6. PPL Electric's attorneys are authorized to receive all notices and communications regarding this Letter of Notification.

7. PPL Electric is proceeding by means of a Letter of Notification, instead of a full Application, pursuant to the Commission's regulations at 52 Pa. Code § 52.72(d). This transmission line siting and construction proceeding qualifies for use of a Letter of Notification

because it is entirely within an existing transmission line right-of-way presently owned by PPL Electric and because the project which involves replacing a single 110 foot steel pole with a single 180 foot steel pole, will not substantially alter the right-of-way, especially where the taller pole is far shorter than the adjacent smoke stacks and cooling towers for the coal fired Montour Steam Electric Station ("SES") in Derry Township, Montour County, Pennsylvania. Further, the project involves raising the height of one steel tower and the two spans adjacent to it. The project involves only approximately 1030 feet of transmission line.

8. The project that is the subject of this Letter of Notification is situated entirely on property owned by PPL Montour, LLC, which owns and operates the coal fired Montour SES. PPL Montour, LLC is in the process of installing pollution control equipment at the Montour SES. In order to power the pollution control equipment, it is necessary for PPL Montour, LLC to construct its own 230 kV transmission lines. These transmission lines must cross PPL Electric's Montour-Sunbury 230 kV line and Montour-Columbia 500/230 kV line.

9. In order to accommodate the new 230 kV transmission line of PPL Montour, LLC, PPL Electric is replacing a 110 foot steel pole with a 180 foot steel pole in order to raise the height of its transmission lines. PPL Montour, LLC's new transmission lines will cross beneath the transmission lines of PPL Electric.[1]

10. It is estimated that the proposed modifications to PPL Electric's transmission lines will cost approximately $300,000. The entire cost of the modifications to PPL Electric's transmission lines will be borne by PPL Montour, LLC.

[1] PPL Montour, LLC is an exempt wholesale generator under 15 U.S.C.A. § 79z-5a, and provides no electric supplies to the public. Therefore, it is not subject to the Commission's jurisdiction.

11. Construction of the modification to the Montour-Sunbury 230 kV line and the Montour-Columbia 500/230 kV line is scheduled to begin in August, 2006, with an in service date of October, 2006.

12. The Necessity Statement for the project is provided as Exhibit A to this Letter of Notification.

13. The project will be designed, constructed, operated and maintained in a manner that meets or surpasses National Electrical Safety Code ("NESC") standards and all applicable legal requirements. The proposed project will not create an unreasonable risk of danger to the public health or safety. Descriptions of NESC standards and PPL Electric's design criteria and safety practices are set forth in Appendix A to the accompanying exhibits.

14. The Engineering Description of the project is provided in Exhibit "B" to this Letter of Notification.

15. As previously explained, the proposed line modifications to the Montour-Sunbury 230 kV line and the Montour-Columbia 500/230 kV line involve the replacement of a single 110 foot steel pole with a 180 foot steel pole which will raise the two adjacent transmission line spans. The project is located entirely on land of PPL Montour, LLC over which PPL Electric has a transmission line right-of-way. Therefore, there will be no additional impact on existing land use.

16. No nearby railroads, communication towers, pipelines or other utilities will be affected by the proposed project. The nearest aviation facility is the Danville Airport which is located 8.3 miles from the project's location.

17. The increased height of the new steel pole will not harm the appearance of the area because even the new, higher steel pole will be significantly lower that the Montour SES's smoke stacks and cooling towers. For the same reason, it will pose no threat to aircraft.

18. A project review by the Pennsylvania Historical and Museum and Commission has determined that this project will have no effect on archeological resources.

19. Based upon a review of registries of historic landmarks, districts and properties, there are several structures of historical interest in the vicinity of the project. The project, however, will have no impact on these structures due to its small scope and the presence of the nearby power plant.

20. The project will not affect any unique geological, scenic or natural areas. No National Natural Landmarks, parks, or recreational facilities are located near the project area. No tree clearing is required. The line will not cross any wetlands or other aquatic resources. In conducting the work necessary for this project, PPL Electric will employ, as appropriate, the mitigating measures set forth in its "Specification for Soil Erosion and Sedimentation Control of Transmission line Rights-of-Way."

21. PPL Electric has coordinated with state and federal agencies and determined that, except for occasional transient species of wildlife, no threatened or endangered plant or animal life is found in the project area. Therefore, no threatened or endangered plant or animal species will be affected by the project.

22. The Environmental Assessment for the project is provided as Exhibit "C" to this Letter of Notification.

23. Appendix B to this Letter of Notification explains PPL Electric's standards for Magnetic Field Management.

24. Appendix C to this Letter of Notification is a list of property owners within PPL Electric's transmission line right-of-way. As shown there, the project is situated entirely on land owned by PPL Montour, LLC. Further, the project is entirely within the existing transmission right-of-way of PPL Electric. No additional right-of-way is required.

25. The proposed project was reviewed with Derry Township and Montour County, and neither the Township nor the County has any objection. A list of involved governmental agencies, municipalities and other public entities is presented in Appendix D.

26. A copy of this Letter of Notification is being served in accordance with 52 Pa. Code §57.72(d)(3).

27. As soon as practicable after the filing of this Letter of Notification, PPL Electric will publish notice of the filing in newspapers of general circulation in the area of the proposed project. Such notice will contain: (a) the date this Letter of Notification was filed with the Commission; (b) a brief description of the project and its location; (c) locations where the complete Letter of Notification may be reviewed by the public; and (d) an instruction that the interested parties should contact, within 15 days, James J. McNulty, Secretary, at the Commission's Harrisburg address.

28. This Letter of Notification is filed on the date set forth below. As provided in 52 Pa. Code § 57.72(d)(5), the Commission will review and, by order, approve or disapprove this Letter of Notification. If the Commission approves this Letter of Notification, the proposed project will be constructed as proposed herein without the formal application process set forth at 52 Pa. Code §§ 57.71 *et seq*. If the Commission does not approve this Letter of Notification, the Commission's Order shall direct PPL Electric to file for approval to construct the proposed project pursuant to the Commission's formal certification regulations.

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Commission approve the modifications of the Montour-Sunbury 230 kV line and the Montour-Columbia 500/230 kV lines as proposed herein.

Respectfully submitted,

David B. MacGregor
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Fax: 215-320-4879
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Fax: 610-774-6726
E-mail:perussell@pplweb.com

Of Counsel:

Post & Schell, P.C.

Date: March 15, 2006

Attorneys for PPL Electric Utilities Corporation

ORIGINAL

Before the
Pennsylvania Public Utility Commission

Montour – Sunbury 230 kV Line And Montour – Columbia 500/230 kV Line Modification

Letter of Notification

Application Docket No. A-110500 F0375

Submitted by: PPL Electric Utilities Corp.

SUMMARY

This filing is submitted by PPL Electric Utilities Corporation (PPL EU) pursuant to the Pennsylvania Public Utility Commission's (PUC or the Commission) regulations at 52 Pa. Code §§57.71 through 57.77 for PUC approval to increase the height of a section of the existing double circuit Montour – Sunbury 230 kV Line and Montour – Columbia 500/230 kV Line. The increased height is required to provide proper electrical clearances between the existing lines and two new 230 kV transmission lines. The new 230 kV lines are required to power new pollution control equipment at PPL Montour's coal-fired power plant. The new transmission lines will be owned by PPL Montour, LLC and therefore, are exempt from the siting regulations.

The estimated cost to design and modify the existing double circuit Montour – Sunbury 230 kV Line and Montour – Columbia 500/230 kV Line is approximately $300,000. Construction is scheduled to begin in August 2006 to support the project's in-service date of October 2006.

This document, which describes the need for the project and discusses the engineering and siting analysis for the proposed construction, consists of the following exhibits and appendices:

Exhibit "A" - Necessity Statement
Exhibit "B" - Engineering Description
Exhibit "C" - Environmental Assessment

Appendix A - PPL Design Criteria and Safety Practices
Appendix B - Magnetic Field Management at PPL
Appendix C - List of Property Owners Within the Proposed Right-of-Way
Appendix D - List of Involved Governmental Agencies, Municipalities, and Other Public Entities

LOCATION MAP

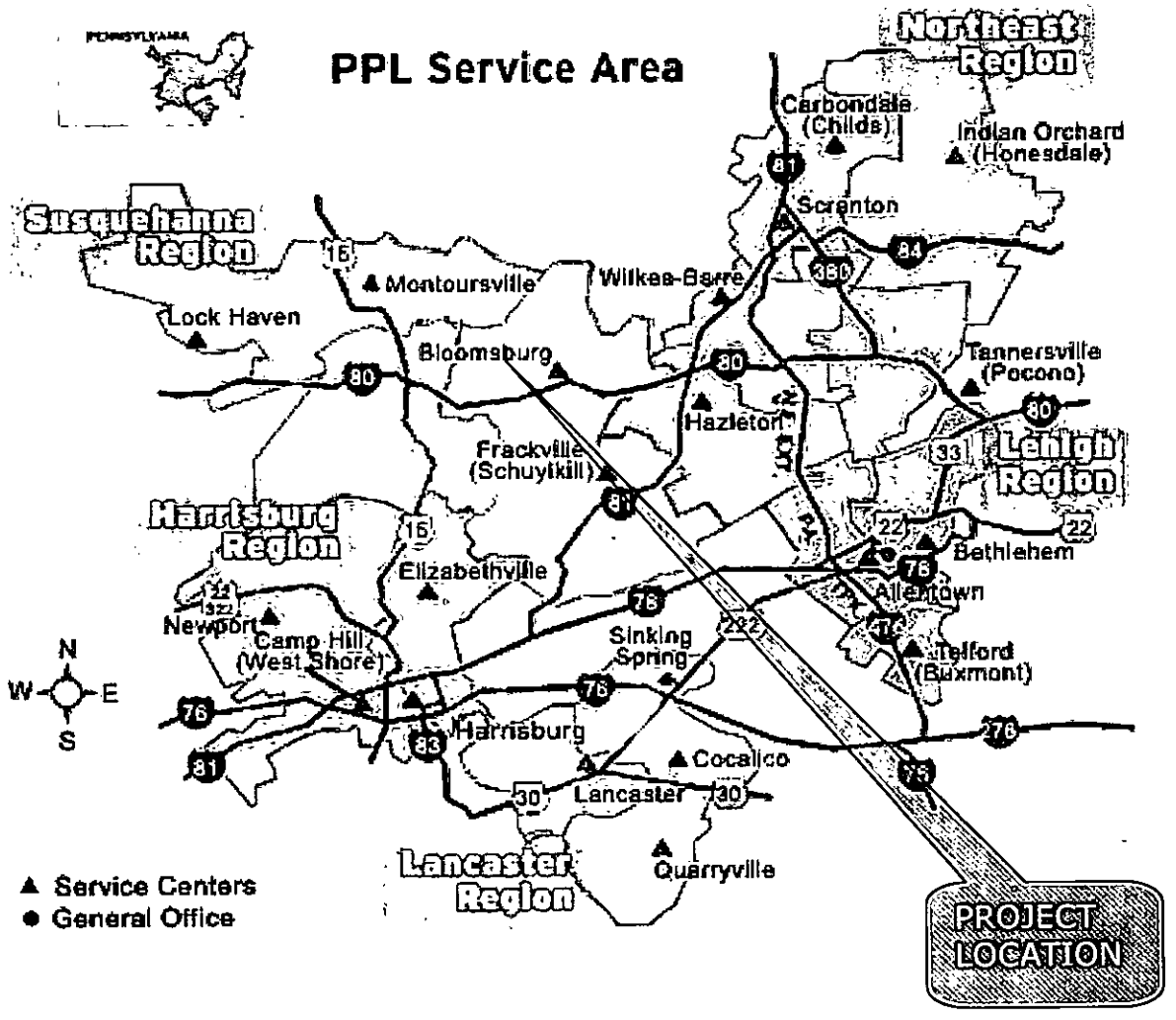


EXHIBIT "A"

MONTOUR – SUNBURY 230 kV LINE AND

MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION

NECESSITY STATEMENT

TABLE OF CONTENTS

EXHIBIT "A"
MONTOUR – SUNBURY 230 kV LINE AND
MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION
NECESSITY STATEMENT

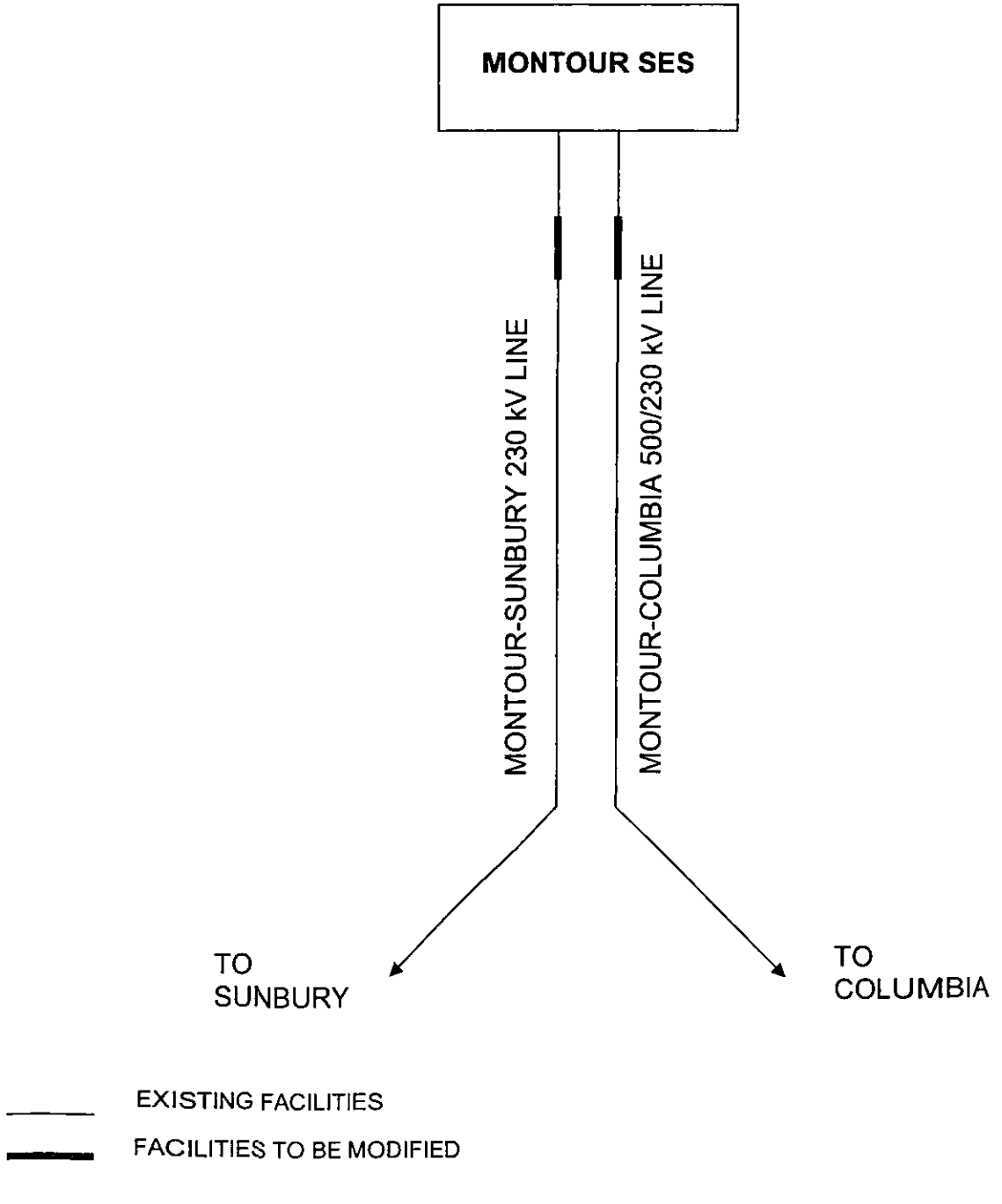
PPL Montour, LLC operates a 1540 MW coal-fired generating station located in Derry Township, Montour County. They are planning to install new air pollution control equipment that will remove nearly all of the sulfur dioxide from plant emissions. In order to provide the required electrical clearances for the new power lines serving the pollution control equipment, PPL must raise the height of a double circuit 230 kV line exiting the power plant. To affect this modification, PPL EU proposes to replace an existing 115 foot tall pole with a new pole 180 feet high. The proposed modification will not change the functionality of the transmission system as shown in Figure 1 at the end of Exhibit "A".

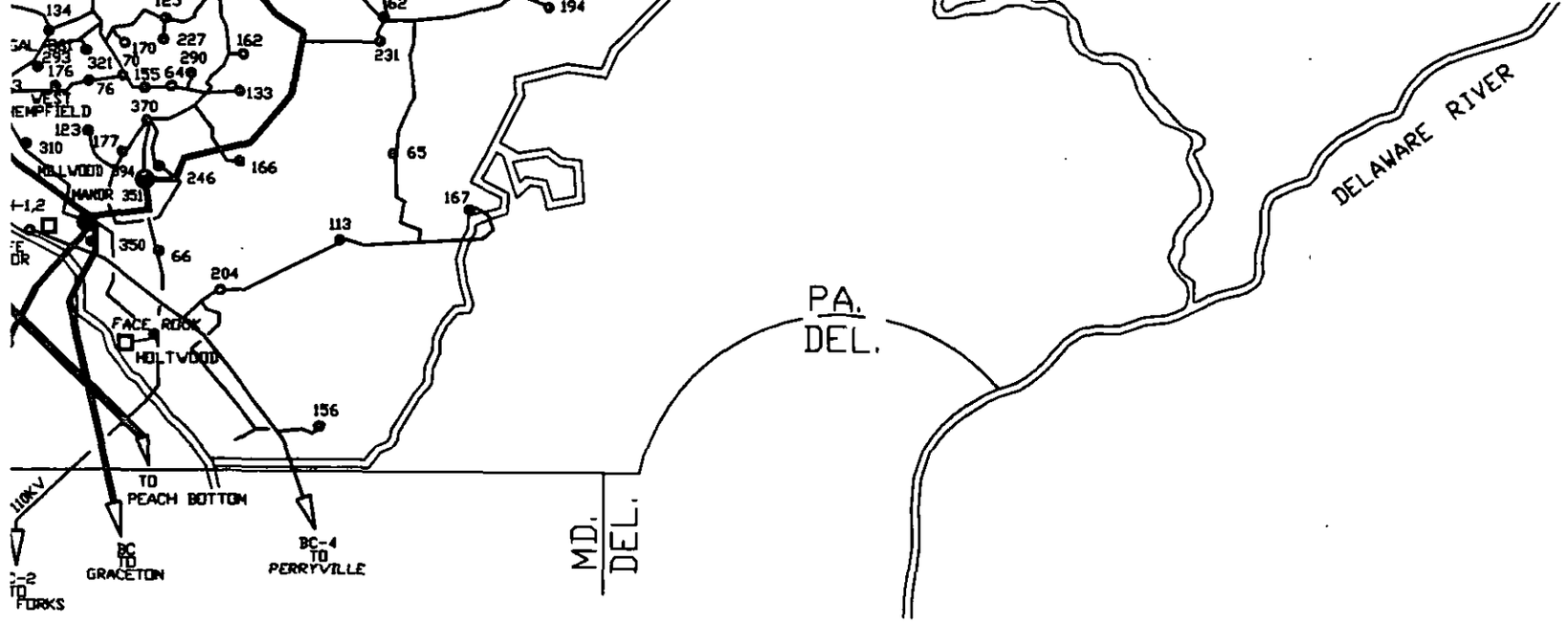
The estimated cost to design and modify the existing lines is approximately $300,000. This cost will be paid by PPL Montour, LLC. Construction is scheduled to begin in August 2006 and be completed by October 2006.

A PPL system map showing transmission facilities with a design voltage of 35 kV or greater is included in the Exhibit "A" map pocket. This filing addresses only the existing and proposed 230 kV regional transmission system in the Derry Township area.

FIGURE 1

FUNCTIONAL 1-LINE DIAGRAM FOR THE MONTOUR – SUNBURY 230 kV LINE AND MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION





OVER SIZED DOCUMENTS

INE

TCHING STATION

ERATION

ER PRODUCERS

500KV OPERATION
230KV OPERATION
138KV OPERATION
69KV OPERATION

ADDED MONTOUR-SUNBURY 230KV AND MONTOUR-COLUMBIA 500/230KV LINES	CDW		
	BY	REVIEWED	APPROVED

ACCT- 805201
SCALE- NONE
BY- CDW
REVIEWED

ELECTRICAL SYSTEM
MONTOUR - SUNBURY 230
MONTOUR - COLUMBIA 500/2

APPROVED G. HAKUN III
DATE 7/17/85
PPL EL

PPL DRAWING NO. D191830
SHEET NO.

#6000					C	
LOCATION CODES		PLAN & PROFILE NO.		TRANSMISSION MAP NO.	SORTS	D191830_S001.DWG

EXHIBIT "B"

MONTOUR – SUNBURY 230 kV LINE AND

MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION

ENGINEERING DESCRIPTION

TABLE OF CONTENTS

LIST OF TABLES

MAP

EXHIBIT "B"

MONTOUR – SUNBURY 230 kV LINE AND

MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION

ENGINEERING DESCRIPTION

A. DESCRIPTION OF PROJECT

PPL EU proposes to increase the height of a section of existing double circuit 230 kV transmission line to provide the required electrical clearance for the construction of a double circuit 230 kV line to cross underneath. The new double circuit 230 kV line will be owned by PPL Montour, LLC, a non-regulated entity, and is thereby, exempt from PUC regulation. The project is located at the Montour Steam Electric Station in Derry Township, Montour County.

In order to increase the height of the existing double circuit 230 kV line, PPL will replace a 115 foot tall single-shaft steel pole with a 180 foot tall single-shaft steel pole. The new structure will be installed on a concrete foundation. As required, additional conductor and overhead groundwire (OHGW) will be spliced into the existing lines to maintain design tensions and ground clearances. The additional conductor will be 1590 KCMIL 45/7 stranding ACSR and will match the existing conductor. The OHGW will be 3/8-inch high strength steel and will match the existing OHGW.

The proposed line modification will be designed to, and generally exceed, National Electrical Safety Code (NESC) standards. Design specifications and safety rules practiced by PPL are included in Appendix A. The minimum conductor to ground clearance will be 54 feet, which occurs at a maximum thermal conductor temperature of 125 degrees Celsius. The designed minimum conductor clearances and conductor thermal ratings for the modified line section are as follow:

TABLE 1

DESIGN MINIMUM CONDUCTOR CLEARANCES FOR 1590 KCMIL 45/7 STRANDING ACSR*

Condition	Transmission Double-Circuit Design Clearance-to-Ground
Normal load; average weather (16°C ambient temperature)	58.8 feet
Predicted extreme thermal load (125°C conductor temperature)	54.0 feet
Predicted extreme weather conditions (1/2-inch ice, 8 lbs. wind, -18°C)	59.9 feet

*Clearances based on a maximum tension of 12,660 pounds and a ruling span of 500 feet.

CONDUCTOR THERMAL RATING
1590 KCMIL 45/7 STRANDING ACSR
(257°F) 125°C MAXIMUM CONDUCTOR TEMPERATURE

Condition	Ambient Temperature °C	Wind Speed Knots	Ampacity Amps
Summer Normal	35	0	1,640
Winter Normal	10	0	1,775
Summer Emergency	35	1 1/2	1,965
Winter Emergency	10	1 1/2	2,045

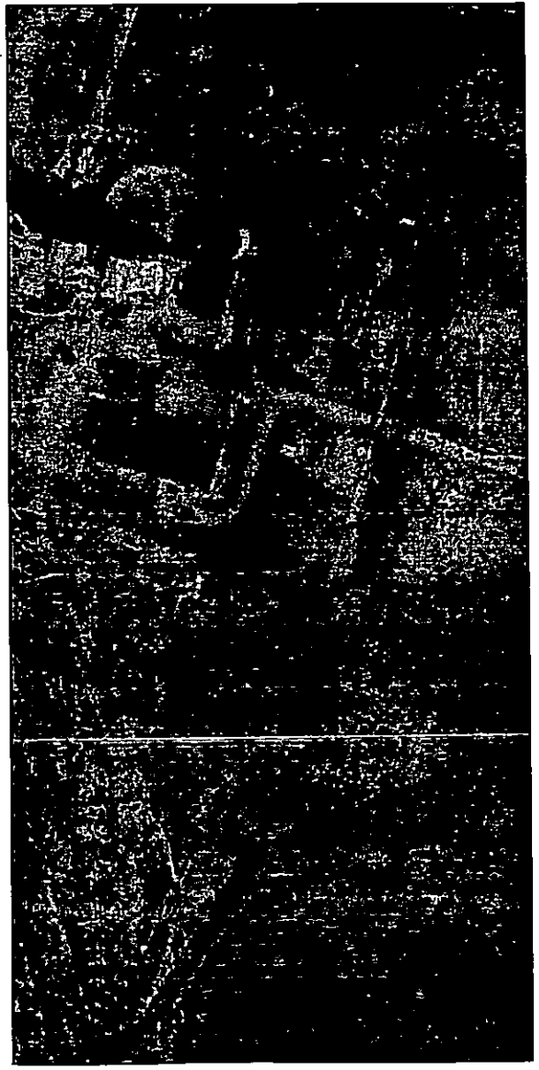
B. MAGNETIC FIELD MANAGEMENT

PPL's Magnetic Field Management Program, summarized in Appendix B, is applied to new and reconstructed transmission line projects. To reduce magnetic field exposures, the program generally prescribes the use of a line design that provides five feet higher ground clearance and reverse phasing of new double circuit lines where it is feasible to do so at low or no cost. The implementation of additional modifications will be considered, provided those modifications can be made at low or no cost.

This project is outside the scope of PPL's Magnetic Field Management Program because the line is not being rebuilt and modifying the line to employ reverse phasing would be prohibitively expensive.

C. RIGHT-OF-WAY STATUS

All work will be completed on existing PPL EU right-of-way. No additional right-of-way is required.



OVER SIZED DOCUMENTS

PPL ELECTRIC U

	BY	REVIEWED	APPROVED

ACCT– 121299	
SCALE– 1"=200'	
BY–	
REVIEWED	

AERIAL EXHIBIT

MONTOUR - SUNBURY 230KV LINE

MONTOUR - COLUMBIA 500/230KV LINE

DERRY TWP. MONTOUR CO.,

APPROVED DATE

PPL ELECTRIC UTILITIES

PPL DRAWING NO.	SHEET NO.	REV.

LOCATION CODES		PLAN & PROFILE NO.		TRANSMISSION MAP NO.		SORTS	

EXHIBIT "C"

MONTOUR – SUNBURY 230 kV LINE AND

MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION

ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

EXHIBIT "C"
MONTOUR – SUNBURY 230 kV LINE AND
MONTOUR – COLUMBIA 500/230 kV LINE MODIFICATION
ENVIRONMENTAL ASSESSMENT

A. INTRODUCTION

PPL EU is proposing to increase the height of an existing double circuit 230 kV transmission line to provide the required clearance for a new double circuit 230 kV transmission line to cross underneath. The new 230 kV lines are required to power new pollution control equipment being installed at PPL Montour's coal-fire power plant. The new 230 kV lines will be owned by PPL Montour LLC and are not subject to PUC certification.

The proposed project was reviewed with Derry Township and Montour County, and neither the Township nor the County has any objection. A list of involved governmental agencies, municipalities and other public entities is presented in Appendix D.

B. LAND USE

The location of this project is at PPL's Montour Steam Electric Station adjacent to the generating units and cooling towers. Therefore, there will be no additional impact on existing land use.

No nearby railroads, communication towers, pipelines or other utilities will be affected by the proposed project. The nearest aviation facility is in Danville, 8.3 miles from the project location. The increased height of the line is lower than the

height of the Montour Steam Electric Station's smoke stacks and cooling towers and will pose no threat to flight operations.

C. CULTURAL RESOURCES

This project was reviewed with the Pennsylvania Historical and Museum Commission (PHMC). PHMC has determined that due to the absence of historical sites and the small project size no further archaeological investigations are required.

The following lists were reviewed for the presence of historical districts and structures in the area:

- National Historic Landmarks in Pennsylvania
- National Register Historic Districts in Pennsylvania
- National Register Individual Properties and Historic Districts in Pennsylvania
- National Register/Listed and Eligible Properties in Pennsylvania

There are several structures of historical interest in the vicinity of the project. Impacts to these historic structures are not expected due to the small scope of the project and its location at an existing power plant.

D. NATURAL FEATURES

The proposed project will not affect any unique geological, scenic, or natural areas. No National Natural Landmarks, parks, recreational facilities, or natural areas are located near the project area. Tree clearing is not required. The line will not cross any wetlands or other aquatic resources. PPL will employ its

"Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way" as appropriate.

E. THREATENED AND ENDANGERED SPECIES

PPL has coordinated with different state and federal agencies to obtain information regarding endangered and threatened species that could occur in the study area. The agencies report that, except for occasional transient species of wildlife, no threatened or endangered plant or animal life is found in the project area.

LIST OF APPENDICES

APPENDIX A

PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corp. (PPL) has developed design specifications and safety rules which meet or surpass all provisions specified by the NESC.

Engineering Design Criteria and Parameters

The NESC includes loading requirements and clearances for the design, construction, and operation of power lines. The "loads" on conductors and supporting structures are the mechanical forces that develop from the weight of the conductors, the weight of ice on the conductors, plus wind pressure on the conductors and supporting structures. Loading requirements are the loads on the conductors and structures that are anticipated assuming certain ice and wind conditions. Loading requirements always contain "safety factors" to allow for unknown or unanticipated contingencies. The clearances and loading requirements contained in the NESC were developed to ensure public safety and welfare.

PPL transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies such things as larger-minimum crossarm dimensions, larger-minimum conductor size, and increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the overhead ground wire (OHGW) and power conductors. The NESC standard ice and wind design magnitudes for the PPL territory are 0.5 inch thickness of radial ice combined with four pounds per square foot horizontal wind pressure (equivalent to 40-mile per hour wind velocity). The conductor sags and tensions used in line designs are the result of various ice and wind combinations, depending on the elevation at the line location and line design voltage. The conductor sags and tensions used in the design of all PPL transmission lines are at least 0.5-inch ice combined with eight pounds wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

Surface Underneath Conductors	Vertical Clearance to Ground	
	NESC Standard	PPL Design
Roads, streets, alleys	21 Ft.	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	21 Ft.	30 Ft.
Spaces accessible to pedestrians only	17 Ft.	30 Ft.
Railroad tracks	31 Ft.	35 Ft.

230 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	23 Ft.	32 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	23 Ft.	32 Ft.
Spaces accessible to pedestrians only	19 Ft.	32 Ft.
Railroad tracks	31 Ft.	36 Ft.

500 kV

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
Roads, streets, alleys	28 Ft.	53 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	28 Ft.	53 Ft.
Spaces accessible to pedestrians only	24 Ft.	53 Ft.
Railroad tracks	38 Ft.	53 Ft.

A relay protection system is used to protect the public safety and welfare as well as equipment and the transmission system. Relay protection is installed for all transmission lines to automatically de-energize the line in the unlikely event that the line or supporting structure fails and the line contacts the ground.

Periodic Maintenance Program on All Transmission Lines

To ensure continued public safety and integrity of service, a periodic maintenance and inspection program is implemented for every transmission line. The program is

administered through the use of helicopter patrols, with supplemental foot and structure climbing patrols. A number of helicopter patrols are performed on all lines annually. The two-man helicopter crew flies parallel, to the left, and above the line so that the observer can look for signs of line damage or deterioration and observe clearances between vegetation and conductors. The observations are included in a report that is forwarded to the appropriate department for corrective action.

Foot and structure climbing patrol programs for a transmission line begin approximately three to five years after the line is energized, unless a helicopter patrol reports a need for earlier action. The frequency of foot patrols varies from once every year to once every several years depending on line type and age.

An assigned foot patroller checks right-of-way conditions, including access roads, bridges, pole washouts, tower footers, vegetation height and clearance to conductors, pole and tower deterioration and, with the use of binoculars, insulators, and condition of hardware. Identified problems are included in a report that is forwarded to the appropriate department for corrective action.

A scheduled line outage is required to perform an overhead patrol because of "hands-on" inspection of hardware. Overhead patrols are conducted on a schedule determined by line age, operating record, and observed general condition. The necessary repairs are also done during the inspection outage.

Personnel Safety Rules

The following are a few of the PPL safety rules that demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energized facilities in a safe manner. When lines or apparatus are removed from service to be worked on, the Energy Control Process system is applied. This system provides that a red tag must be physically placed on the control handle of the de-energized equipment. The red tag may be removed only after proper authorization to energize the equipment.

Various other tags are used for limited operations and informational purposes. Employees will not apply or remove a tag or change the status of tagged equipment unless authorized.

- Temporary safety grounds are used on de-energized facilities for employee safety during maintenance, construction, or reconstruction work. Safety grounds are wires connecting the de-energized facility to an electrical ground. If the facility should be energized, the safety grounds will divert the current directly to ground and reduce the likelihood of personal injury. The conductor size and attachment clamps of temporary safety grounds must be capable of conducting anticipated fault currents. Rubber gloves, rubber sleeves, and additional rubber protective equipment are used as required when applying or removing temporary safety grounds to or from the lines or apparatus to be grounded. An approved nonconductive working stick of sufficient length to allow workers to maintain the following required minimum clearances is used to test that the line has been de-energized and to apply temporary safety grounds:

Voltage-kV	Minimum Clearance
138	3'-7"
230	5'-3"
500	11'-3"

Before applying grounds, a test is done to confirm that the line is de-energized. The voltage test device is checked before and after use to assure reliability. When ground pins are used to establish proper ground points, they are driven to a depth of not less than four feet as near vertical as possible.

- Poles or structures are inspected and examined for structural integrity before climbing. If there is any reason to believe that a pole is unsafe, it is stabilized before work is performed. Appropriate safety gear in the form of body belts, safety straps, hard hats, gloves, etc., is worn by linemen during line work activity.

MAGNETIC FIELD MANAGEMENT

PPL Electric Utilities Corporation

APPENDIX B

DECEMBER 2004

TABLE OF CONTENTS

INTRODUCTION

At PPL Electric Utilities Corp. (PPL EU), magnetic field management means investigating and implementing methods at low or no cost to reduce magnetic fields in new or rebuilt transmission and distribution lines. This document explains PPL EU's Magnetic Field Management Program, which is part of PPL EU's larger Electric and Magnetic Fields (EMF) policy.

PPL EU's View

Some people are worried that electric and magnetic fields are harming their health. Others think the scientific research does not show a problem at all, and still others believe there's just too much scientific uncertainty to draw any conclusions.

Here's what we do know now. Various panels of scientists that have reviewed the EMF research generally have drawn two main conclusions. First, the large body of evidence does not demonstrate that EMF are harmful. Second, additional research is recommended to explore questions raised in some studies.

Given these conclusions, PPL EU is taking a reasoned approach in responding to the EMF issue. PPL EU's approach to the EMF issue consists of five elements:

- Providing EMF information to customers and employees
- Providing magnetic field measurements
- Establishing and implementing a magnetic field management program to reduce magnetic fields in new or rebuilt facilities when it can be done at no, or low, cost
- Integrating EMF in the public involvement process that PPL EU undertakes in the siting of transmission lines
- Have supported additional research

EMF Are All Around Us

Electric and magnetic fields occur in nature and in all living things. The earth, for instance, has a magnetic field, which makes the needle on a compass point north.

Electric fields and magnetic fields of a different type also surround every wire that carries electricity. In everyday life, these EMF arise from several basic sources, including power lines, electrical appliances, home and building wiring, other utility lines and cables, and currents flowing on water pipes. Though they often occur together, EMF are made up of two separate components:

Electric Fields

Electric fields are produced by the voltage—or electrical pressure—on a wire. The higher the voltage, the higher the electric field. As long as a wire is energized—has voltage present—an electric field is present (see Figure 1). In other words, an appliance, or an electric power line, doesn't actually have to be turned on to create an electric field. It just has to be plugged in. Electric fields diminish with distance and can be blocked or partially shielded by objects such as trees and houses.

Magnetic Fields

Magnetic fields are created by the current or flow of electricity through a wire. Generally speaking, the higher the current, the higher the magnetic field. Because they only occur when current is flowing, magnetic fields are present only when the power is turned on (see Figure 1). Magnetic fields also diminish with distance, but—unlike electric fields—are not blocked by common objects. In recent years, public and scientific interest has turned toward the magnetic field component of EMF because of some scientific studies regarding these fields.

Figure 1

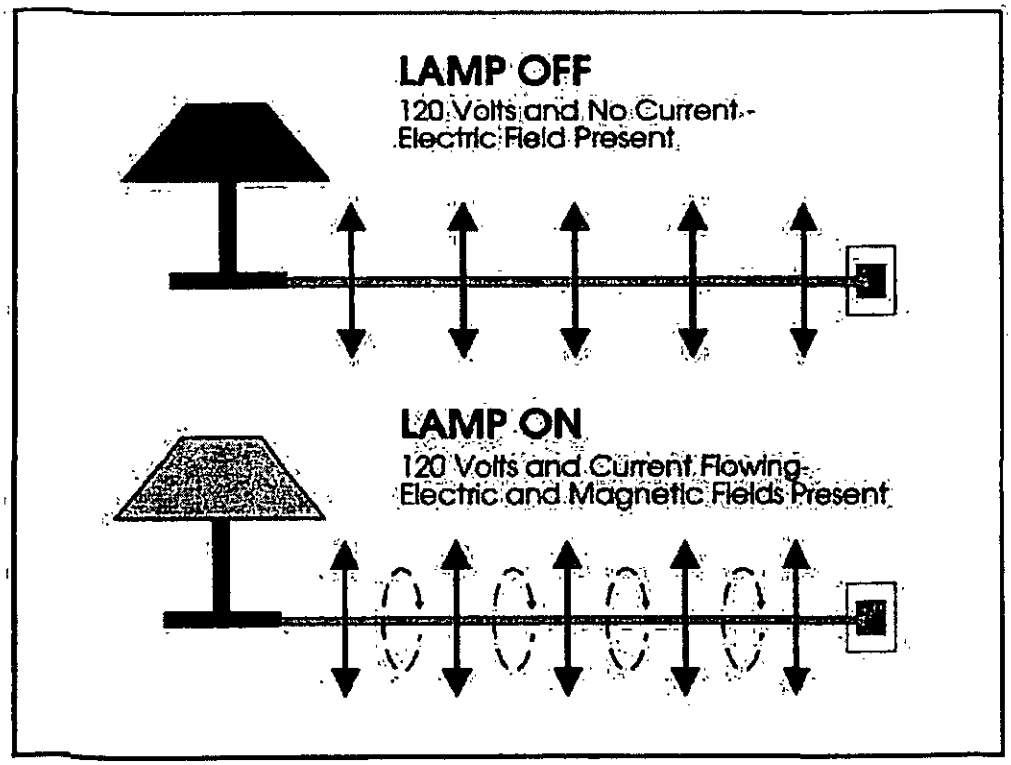

LAMP OFF
120 Volts and No Current -
Electric Field Present
LAMP ON
120 Volts and Current Flowing -
Electric and Magnetic Fields Present

Figure 2

Magnetic field strengths decrease with distance Magnetic fields are measured in milligauss	Source: "EMF In Your Environment", U.S. Environmental Protection Agency 1992 At 6 inches	At 1 foot	At 2 feet
Clothes dryer 	2 to 10	* to 3	*
Microwave oven 	100 to 300	1 to 200	1 to 30
Toaster 	5 to 20	* to 7	*
Power drill 	100 to 200	20 to 40	3 to 6
Can opener 	500 to 1500	40 to 300	3 to 30
Mixer 	30 to 600	5 to 100	* to 10
Hair dryer 	1 to 700	* to 70	* to 10
Color television 	Data not available	* to 20	* to 8

FIGURE 2 * The magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

Measuring Magnetic Fields

Magnetic fields usually are measured in a unit called a milligauss. Magnetic field levels found in the living areas of homes typically range from less than 1 milligauss to about 4 milligauss according to the U.S. Environmental Protection Agency. They can be higher in some cases. The levels next to appliances can exceed 1,000 milligauss (1 gauss). Figures 2 and 3 show how the strength of the field falls off as you move away from the source, just as the heat of a campfire grows weaker as you walk away from it. For overhead power lines, the strength of the magnetic fields is dependent upon a number of factors that will be explained later. Those factors produce a magnetic field that drops off rapidly as you move away from the power line.

Figure 3

Sample Magnetic Field Levels in Milligauss				
Type of Overhead Power Line	**Distance from the line**			
	Under the line	**50 ft.**	**100 ft.**	**200 ft.**
220 kV and 500 kV	5-400	5-250	1-75	0.5-20
69 kV and 138 kV	3-80	0.5-2.5	0.1-10	0.1-3
12 kV and below	0.4-20	0.1-1	-	-

The magnetic field values provided in this table represent a general range of values associated with the types of overhead power lines listed and are provided for illustration. There will be circumstances in which there will be magnetic field levels above or below the range of values provided due to variations in such factors as height of the wires, current flow and so on.

DEVELOPMENT OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

One element of our response to EMF concerns expressed by some of our customers is PPL EU's Magnetic Field Management Program. The program was initiated in March 1991 because PPL EU believes it makes good sense, as a matter of policy, to respond to the concerns expressed by some of our customers and to reduce magnetic fields in new and rebuilt facilities where it can be done with either no-cost or low-cost design changes.

This document updates the original program which has been revised several times since 1991. These guidelines were developed by PPL EU's EMF Working Group.

VARIABLES THAT AFFECT MAGNETIC FIELDS

Magnetic fields from transmission and distribution lines are a function of a number of design variables. The following parameters affect the magnetic field levels produced by transmission and distribution lines:

- Current
- Height of conductors above ground
- Configuration of conductors
- Distance from the line

EFFECT OF PHASE CURRENT ON MAGNETIC FIELDS

At power frequencies (i.e., 60 hertz), the magnetic field level is a function of the current or flow of electricity through a wire. Keeping all other parameters the same, the magnetic field is proportional to the current. Hence, if the current increases by 25 percent, the resulting magnetic field level will increase by 25 percent.

The overall load current on any line varies with the demand for power. It's usually highest during daytime hours and lowest at night. There also are weekly, monthly, seasonal and yearly variations.

The difference in the currents between each phase in a multiphase line also can affect the magnetic field. This difference is called phase unbalance. For a constant load, a statistical analysis of this phase unbalance can be made to determine its effect on the magnetic field. Close to the line, there is very little effect. However, the phase unbalance slows the rate at which the magnetic field decreases with distance from the line.

Effect of Conductor Configuration on Magnetic Fields

In the transmission and distribution of power, utilities like PPL EU presently use both three-phase and single-phase lines. Each phase on a three-phase power line has either a single conductor or a bundle of two or more conductors. In a three-phase system, the ground-level magnetic field is a result of the fields produced by the currents in each of the phases. Placing the three phases as close together as possible (compaction) creates some field cancellation, and the ground-level magnetic field is reduced. However, appropriate phase separation is required for the reliable operation of the line. In addition, the arrangement of the phases can create some; field cancellation and reduction of the ground-level magnetic field.

Effect of Distance From the Magnetic Field Source

Magnetic field strength diminishes with the vertical and lateral distances from the magnetic field source. Increasing the height of the conductors above ground is useful for magnetic field reduction at ground level, but may result in increased structure costs and increased aesthetic impact of the structures. Another possible method of increasing the distance to the magnetic field source is to increase the right-of-way requirements. By keeping buildings off increased rights of way, thereby requiring the public to live and work further away from lines, exposure to magnetic fields produced by the lines can be reduced. Increases in right of way are not always practical and may increase costs significantly, however.

SUMMARY OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

Under its Magnetic Field Management Program, PPL EU has changed the way it builds and rebuilds some of its transmission and distribution lines. These design changes reduce magnetic field levels (assuming balanced circuit loadings and phase currents) by up to 69 percent in most of the company's new transmission lines. These guidelines now are being applied to new and reconstructed transmission facilities, based on this program.

The distribution component of the program focuses on 12 kV lines, the company's standard distribution voltage. It concentrates on the three-phase, primary 12 kV lines, since these are the most heavily loaded facilities and often are located in densely populated areas. The guidelines in this program are being applied to these three-phase, primary 12 kV lines.

A maximum 3-5 percent change in estimated cost was used as the limit for the guidelines since this value is consistent with low cost, is within estimating accuracy and is likely to have little impact on overall line costs.

The magnetic field calculations used in this document for the design of PPL EU's overall magnetic field management plan assume balanced load conditions among the phases and a fixed level of current, not necessarily representative of specific transmission or distribution lines. These levels were calculated using the Electric Power Research Institute's ENVIRO computer program. Under actual operating conditions, the magnetic field levels that result may vary due to such things as actual load per circuit, overall current on each phase conductor and the electrical configuration and operation of each line.

MAGNETIC FIELD MANAGEMENT PROGRAM GUIDELINES

The guidelines for magnetic field management are noted below, with discussion points for each.

OVERHEAD LINES

NEW OR REBUILT TRANSMISSION LINES

1. **Balance transmission circuit loads and phase currents as much as possible.**
   - PPL EU should continue to make every effort to balance loadings between the two circuits of a double circuit line when planning new or rebuilt facilities to maximize the effects of reverse phasing.
   - PPL EU should continue the practice of balancing single-phase loads across the three phases of the distribution system. (Unbalanced phase currents on the distribution system are reflected through to the transmission system.)
     - Unbalanced phase currents result in higher magnetic fields that do not drop off as quickly with distance as do the fields resulting from balanced phase currents.
     - For a 5 percent phase current unbalance, the magnetic field 50 feet from the centerline of a single circuit 138 kV line could be more than twice the value than if the same line had balanced phase circuits.
   - Balanced phase currents on each three-phase distribution circuit also reduce magnetic fields from the distribution circuits themselves. In addition, they reduce magnetic fields on the transmission system from which the distribution system circuits are supplied and connected through substations.
   - Apart from magnetic field considerations, balanced phase currents on each three-phase distribution circuit also reduce line losses and improve the system voltage.

2. **Continue with the present practice of using long-span construction as the PPL EU 138/69 kV standard**

- Structure designs for short-span and long-span construction are illustrated on Charts I and II, respectively.
  - Short-span design does not significantly reduce magnetic fields when compared to long-span design even though it is more compact than long-span design. Comparison of the magnetic field values from Chart III indicates essentially the same values. Therefore, short-span design should not be used solely to reduce magnetic fields.
  - PPL EU will continue to use long-span construction for 138/69 kV double-circuit lines and for single-circuit/future-double-circuit lines.
  - For single-circuit/future-double-circuit lines, PPL EU will continue to install two conductors on the top positions and one in the middle position as shown in Chart IV.
    - This arrangement minimizes magnetic fields as shown in Chart V by placing the three initial conductors higher on the structure, which increases the ground clearances, and by placing the conductors in a triangular configuration.

3. **Compact design structures are not a low-cost alternative and should be used for magnetic field reduction only in special applications.**

Chart VI illustrates the compact design structure.

- The compact design increases the initial installation costs by 79 percent when compared to the long-span design but reduces the magnetic field from 9 mG to 3 mG (about 67 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.

4. **Reverse phase new or rebuilt double-circuit transmission lines for all voltage levels.**

- Reverse phasing was adopted by PPL EU in March 1991 for double-circuit 138/69 kV transmission lines and in April 1992 for all other double circuit transmission lines. Reverse phasing is shown in Chart VII. Reverse phasing will reduce the magnetic fields when the current flow on both circuits is in the same

direction. Calculated values contained here are based on balanced and equal phase currents on both circuits.

- Reverse phasing reduces the magnetic field of a double circuit 138 kV single pole transmission line from 29 mG to 9 mG (about 69 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.
- Reverse phasing reduces the magnetic field of a double circuit 230 kV single pole transmission line from 49 mG to 16 mG (about 67 percent) at the edge of the 150-foot-wide right of way as shown on Chart VIII.
- Reverse phasing reduces the magnetic field of a double-circuit 500 kV single pole transmission line from 37 mG to 21 mG (about 43 percent) at the edge of the 200-foot-wide right of way as shown on Chart IX.

• When new or rebuilt double-circuit lines require tapping existing double-circuit lines, PPL EU will review the existing lines to determine if reverse phasing can be provided at low cost.

• Computer modeling is required to develop the optimum phasing and overall conductor arrangements for lines added to, or rebuilt in, multiple-line corridors.

- Merely adding a reverse-phase double-circuit line to an existing transmission line corridor or reverse phasing a rebuilt line in the multiple-line corridor will not necessarily produce lower magnetic field levels at the edge of the corridor right of way.
- The corridor must be computer modeled with all the lines, existing phase conductor locations and currents. Then, magnetic field calculations must be made varying the phase arrangements of the new or reconstructed line to determine the appropriate phasing arrangement.
- Current flow direction on a line also must be considered. For example, a reverse-phased line should have the current flowing in the same direction on both circuits. If the current flow is in the opposite direction for one circuit, reverse phasing will not produce the lowest magnetic field and another phase arrangement that produces lower fields may need to be utilized.

5. **Increase the minimum ground clearance for all new transmission lines.**

138/69 kV Transmission Lines

- Increasing the minimum line design ground clearance from 25 feet to 30 feet may add up to about 5 percent to the installed cost of a new double-circuit single pole 138/69 kV line. For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. With long-span reverse-phase design, the, magnetic field is reduced from 9 mG to 7 mG (about 22 percent) at the edge of a 100-foot-wide right of way as shown in Chart X.
  - In the actual design of transmission lines to include higher minimum ground clearances, there may be limited segments (such as highway crossings, severe slopes and transmission line crossing locations) where National Electrical Safety Code (NESC) minimum ground clearances may need to be used. The NESC minimum ground clearances are less than the increased ground clearance discussed previously.

230 kV Transmission Lines

- Increasing the minimum line design ground clearances from 27 feet to 32 feet may add up to about 5 percent to the cost of a single-circuit single-pole line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 30 mG to 28 mG (about 7 percent) at the edge of a 150-foot-wide right of way.
- Increasing clearances from 27 feet to 32 feet could theoretically add up to about 2.8 percent to the cost of a double-circuit single-pole line (current standard) and reduce the magnetic field of a reverse-phase line from 16 mG to 15 mG (about 6 percent) at the edge of a 150-foot-wide right of way. Chart XI is a summary of this data.
- Studies are required for each new 230 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such

studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced phase spacing (a "Delta" configuration on a single-circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

500 kV Transmission Lines

- Increasing ground clearances from 33 feet to 53 feet may add up to about 4.5 percent to the cost of a single-circuit "H-frame" line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 42 mG to 35 mG (about 17 percent) at the edge of a 200-foot-wide right of way.
- Increasing ground clearances from 33 feet to 53 feet could theoretically add up to 2.8 percent to the cost of a double-circuit "H-frame" line (current standard) and reduces the magnetic field of a reverse-phase line from 21 mG to 16 mG (about 24 percent) at the edge of a 200-foot-wide right of way. Chart XII is a summary of this data.
- Studies are required for each new 500 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced-phase spacing (a "Delta" configuration on a single circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

RECONDUCTORING OR ADDING ADDITIONAL CIRCUITS TO EXISTING TRANSMISSION LINES

When reconductoring or adding additional circuits to existing transmission lines, PPL EU will evaluate low-cost or no-cost options for magnetic field management on a case-by-case basis.

When reconductoring existing transmission lines or adding additional circuits, low-cost alternatives may not exist; however, the following steps will be taken:

- For a single-circuit line, the use of a Delta arrangement or other modifications on the existing structure, with reduced-phase spacing, will be evaluated.
- For double-circuit lines, application of reverse phasing may reduce the magnetic field under the line and within the right of way and will be evaluated.
- For single- and double-circuit lines, evaluate using higher conductor tensions that can increase the minimum line design ground clearance.

DISTRIBUTION LINES

At the 12 kV distribution level, new main three-phase lines will continue to be constructed with five feet of additional ground clearance.

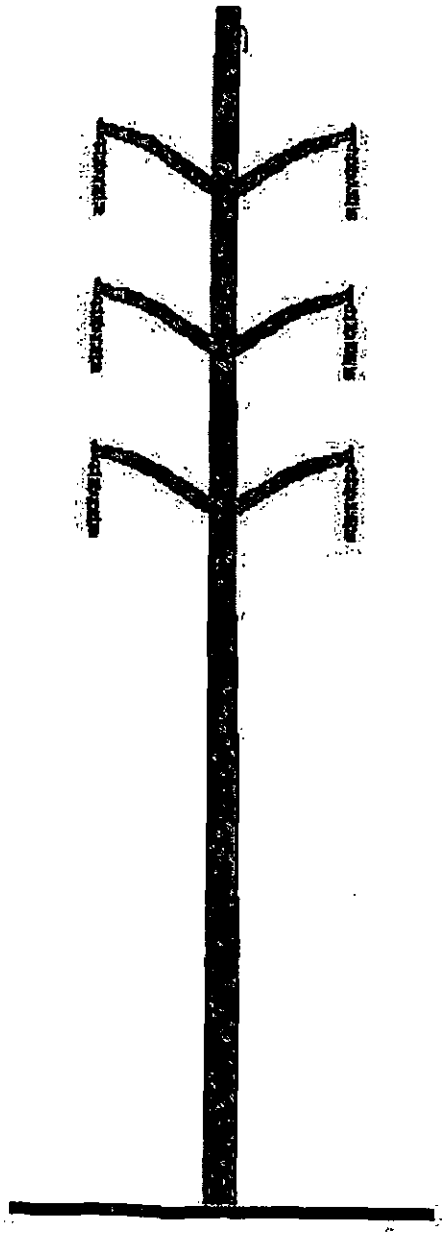
- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These values are based on increasing pole heights from 45 feet to 50 feet and a typical operating current of 300 amps per phase.
- Chart XIII is a summary of this data. Increasing ground clearance by five feet could theoretically add about 5 percent to the cost of a typical distribution line.

UNDERGROUND TRANSMISSION LINES

Underground transmission lines are required due to environmental or land use factors or restrictions on available clearances, PPL EU will evaluate options for magnetic field management techniques on a case-by-case basis.

- The phase arrangement that produces the lowest field will be determined.
- The depth of burial of the line will be determined considering the cost of excavation and the location of other buried utilities in the area.
- The use of steel pipe ferromagnetic shielding that reduces magnetic fields will be evaluated.

Short-Span Construction

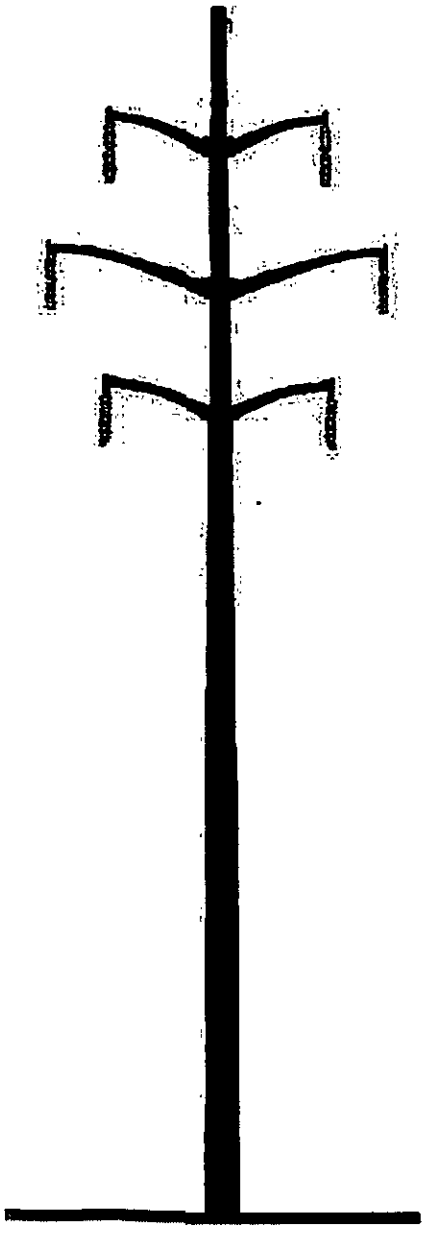


- **More compact design**
- **Should not be used solely to reduce magnetic fields**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 7.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 10.0 feet sag
  Average span - 400 feet

CHART II

Long-Span Construction Remains PPL EU 138 kV Standard



- **Lower cost alternative**
- **Reduces magnetic fields due to higher structures**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 17.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
  Average span - 600 feet

138/69 kV REVERSE-PHASE TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SHORT SPAN (CHART I)	30
SHORT SPAN (REVERSE PHASE)	8
LONG SPAN (CHART II)	29
LONG SPAN (REVERSE PHASE)	9
COMPACT (CHART VI)	14
COMPACT (REVERSE PHASE)	3

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.
LONG SPAN, SHORT SPAN and COMPACT are double-circuit lines.

CHART IV

Typical Single-Circuit Structure Designs

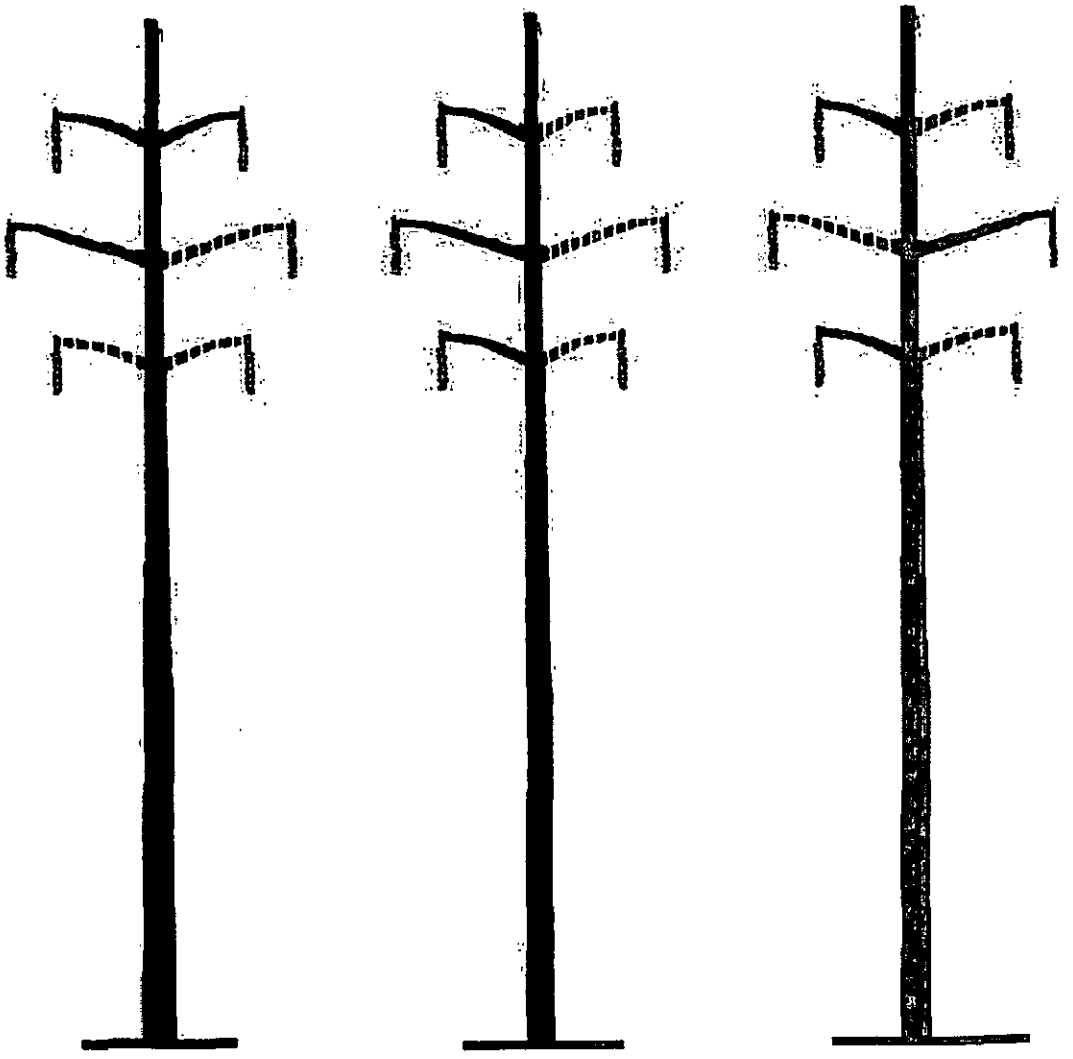


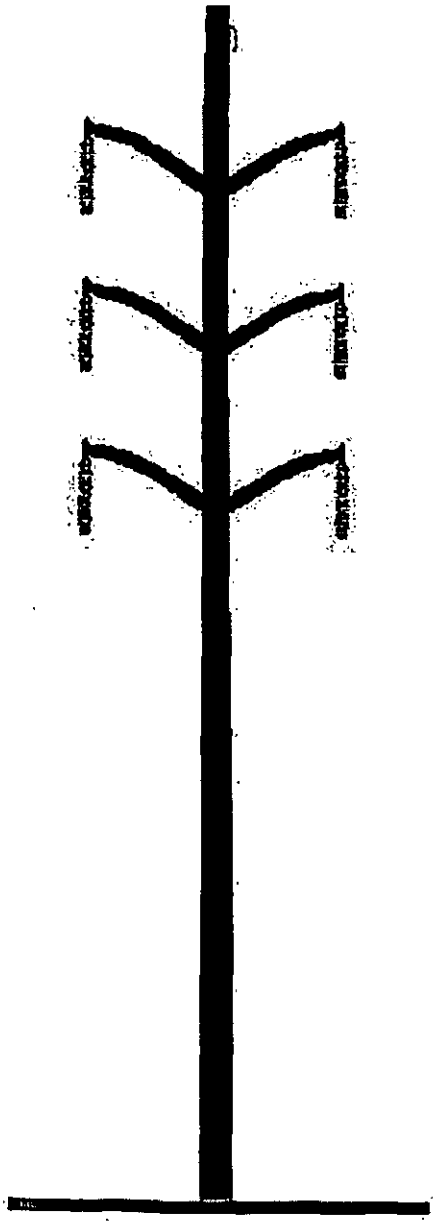
CHART V

138/69 kV SINGLE CIRCUIT TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
TOP/MIDDLE/BOTTOM	20
VERTICAL	17
TOP/MIDDLE	12

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.

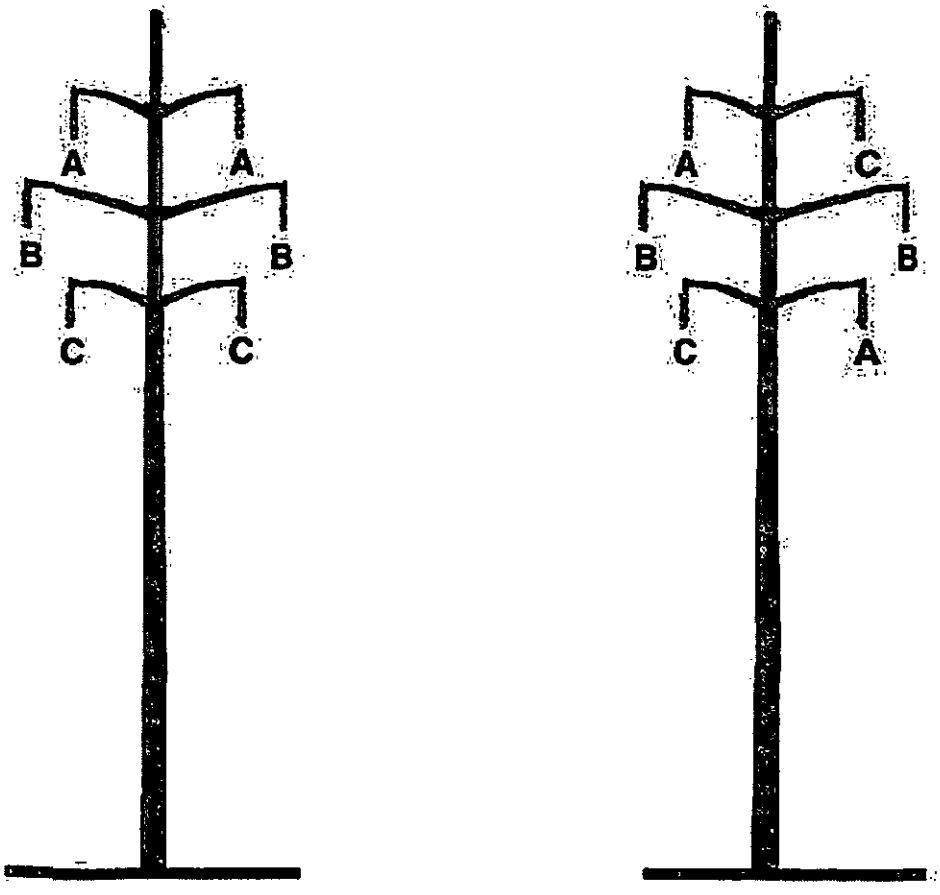
Compact Design Structure



- **Minimize magnetic fields due to compact design**
- **Not a low-cost alternative**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 9.0 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 9.0 feet sag
  Average span - 300 feet

Reverse Phasing of Double-Circuit Transmission Lines



From: → → → → To:

Reverse phasing also can be one of the following phase arrangements:

A	B		B	A		B	C		C	A		C	B	
C	C	or	C	C	or	A	A	or	B	B	or	A	A	
B	A		A	B		C	B		A	C		B	C	

CHART VIII

230 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	49
DOUBLE CIRCUIT POLE (REVERSE-PHASE)	16

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 27 feet.

CHART IX

500 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 1100 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	37
DOUBLE CIRCUIT POLE (REVERSE PHASE)	21

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 33 feet.

CHART X

INCREASED 138/69 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	25	12
SINGLE CIRCUIT TOP/MIDDLE	30	10
LONG SPAN	25	29
LONG SPAN	30	26
LONG SPAN (REVERSE PHASE)	25	9
LONG SPAN (REVERSE PHASE)	30	7

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.

CHART XI

INCREASED 230 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	27	30
SINGLE CIRCUIT TOP/MIDDLE	32	28
DOUBLE CIRCUIT POLE	27	49
DOUBLE CIRCUIT POLE	32	46
DOUBLE CIRCUIT POLE (REVERSE PHASE)	27	16
DOUBLE CIRCUIT POLE (REVERSE PHASE)	32	15

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.

CHART XII

INCREASED 500 kV MINIMUM GROUND CLEARANCE CALCULATED MAGNETIC FIELDS AT 1,100 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT "H" STRUCTURE	33	42
SINGLE CIRCUIT "H" STRUCTURE	53	35
DOUBLE CIRCUIT POLE	33	37
DOUBLE CIRCUIT POLE	53	31
DOUBLE CIRCUIT POLE (REVERSE PHASE)	33	21
DOUBLE CIRCUIT POLE (REVERSE PHASE)	53	16

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.

CHART XIII

12 kV DISTRIBUTION LINES
CALCULATED MAGNETIC FIELDS AT 300 AMPERES

TYPE CONSTRUCTION	POLE HEIGHT FEET	MAGNETIC FIELD IN MILLIGAUSS*	
		AT CENTERLINE	AT 30 FEET FROM CENTERLINE
STANDARD CROSSARM	45	14	7
STANDARD CROSSARM	50	11	6

* Field level under the line at mid-span based on 300 amps, balanced loading, one meter above ground level.

APPENDIX C

LIST OF PROPERTY OWNERS WITHIN THE PROPOSED RIGHT-OF-WAY

1. PPL Montour, LLC
   18 McMichael Road
   Washingtonville, PA 17884-0128
   Attn: Michael G. Monroe, Manager - Fossil Generation Assets

APPENDIX D

LIST OF INVOLVED GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES

1. Pennsylvania Historical and Museum Commission
   Bureau for Historic Preservation
   Commonwealth Keystone Building, Second Floor
   400 North Street
   Harrisburg, Pennsylvania 17120-0053
   Attn: Mr. Douglas C. McLearen, Chief

2. Pennsylvania Department of Transportation
   Commonwealth Keystone Building
   400 North Street, 8th Floor
   Harrisburg, Pennsylvania 17120
   Attn: The Honorable Allen D. Biehler, P.E., Secretary

3. Department of Environmental Protection
   P.O. Box 2063
   Market Street State Office Building
   Harrisburg, Pennsylvania 17105-2063
   Attn: Office of Field Operations

4. Montour County Commissioners
   County Courthouse
   29 Mill Street
   Danville, PA 17821
   Attn: Mr. Harold Hurst

5. Derry Township Supervisors
   909 Shed Road
   Danville, PA 17821
   Attn: Mr. David McCollum, Chairman

6. Montour County Planning Commission
   112 Woodbine Lane
   Danville, PA 17821
   Attn: Ms. Betsy Hack

7. Northern Montour Regional Planning Commission
   909 Shed Road
   Danville, PA 17821
   Attn: Kenneth Mertz, Chair

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

IN REPLY PLEASE
REFER TO OUR FILE
Secretary
717-772-7777

March 20, 2006

A-110500 F0375

JOHN H. ISOM
POST & SCHELL, P.C.
17 NORTH SECOND STREET
12TH FLOOR
HARRISBURG PA 17101-1601

Dear Mr. Isom:

Receipt is acknowledged of the Letter of Notification of PPL Electric Utilities Corporation, which has been captioned and docketed to the above number.

This matter will receive the attention of the Commission and you will be advised of any further necessary procedure.

Sincerely,

James J. McNulty
Secretary

JJM:jih

DOCUMENT FOLDER
DOCKETED
MAR 20 2006

COMMONWEALTH OF PENNSYLVANIA

DATE: March 20, 2006

SUBJECT: A-110500 F0375

TO: Bureau of Fixed Utility Services

FROM: James J. McNulty, Secretary

Letter of Notification of PPL Electric Utilities Corporation

We attach hereto a copy of the Letter of Notification of PPL Electric Utilities Corporation, which has been captioned and docketed to the above number.

May we have a report prepared by your Bureau for Public Meeting.

Attachment

cc: Law Bureau

jih