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September 23, 2015

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, PA 17120

**RE: Letter of Notification of PECO Energy Company for Construction of 230 kV
Transmission Facilities to Connect the Post Substation to the Transmission
Grid in the Borough of Marcus Hook and Lower Chichester Township,
Delaware County, Pennsylvania
Docket No. A-2015-2496384**

Dear Ms. Chiavetta:

Enclosed for filing with the Commission is *PECO's Response to Staff Data Requests* with regard to the matter referenced above.

Very truly yours,



Ward Smith
Counsel for PECO Energy Company

WS/ab

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 1. Please provide an engineering assessment of the project including information to address the following:

- a) Provide an analysis of minimum conductor clearances and conductor thermal ratings.
- b) Provide engineering design criteria and parameters such as vertical clearance to ground.
- c) Provide a demonstration detailing how the project will be in compliance with the current NESC including information such as how the ROW will be adequate with NESC requirements.
- d) Please provide information describing how PECO's design specifications and safety rules meet or surpass the requirements specified by the NESC for transmission lines.

PECO Response to Data Request 1: Please provide an engineering assessment of the project including information to address the following:

The 220-39/220-97 project consists of a proposed new 0.35 mile line section to tie in a new substation to the existing 220-39 line. The existing (220-39) line was constructed in 1971 and is located between our Chichester substation and Linwood substation which are located in Lower Chichester Township. The new line section is proposed to tie in two circuits (line-in and line out) approximately 0.35 miles long into the new substation to the existing 220-39 line between structure 287 and 287A.

- a) Provide an analysis of minimum conductor clearances and conductor thermal ratings.

Conductor clearances for the project meet or exceed the requirement of PECO's Engineering Practice EPP-2090 OHT Design Clearances. The clearance requirement in EPP-2090 exceeds the requirements of NESC-2012. Further discussion of PECO clearance requirements are provided in PECO's Response to Data Requests 1 (b), (c), and (d).

PECO provides the following information with respect to thermal ratings. The rating of the conductor segment is:

- Summer Normal = 3670 amps
- Summer Emergency = 4444 amps

The thermal ratings were determined as follows: The proposed new conductor will be 1590 kcmil 54/19 ACSR "Falcon" conductor. Two (2) conductors will be used per phase. The PECO rating methodology AM-PE-4022_R0001 and associated PJM Bare Overhead Conductor Rating-2010 are based on the methodology of the "IEEE-738 Standard for Calculating the Current Temperature Relationship of Bare Overhead Conductors" with the following input parameters:

	<u>Normal Rating</u>	<u>Emergency Rating</u>
Wind speed (fps)	0	2.53
Wind angle	90	90
Latitude	40	40
Amb Temp (Sum/Wint)	35/10	35/10
Elev above sea level (ft)	200	20
Atmosphere	Industrial	Industrial
Sun Time (date@time)	6/10@14:00	6/10@14:00
Emissivity	0.7	0.7
Absorptivity	0.9	0.9
ACSR (Allow. conductor temp)	140 C	140 C

b) Provide engineering design criteria and parameters such as vertical clearance to ground.

NESC Section 232 requires the following vertical clearances for 230 kV facilities:

Ground, Farmland –	22'4"
Roadways, Driveways, Parking Lots --	22'4"
Railroads, above top of rail --	30'4"
Areas not accessible by vehicles --	18'4"

For new construction such as this project, PECO designs the facilities to meet the NESC guidelines, plus a minimum of an additional 3 feet of additional vertical clearance. Similarly, for NESC horizontal clearances, PECO adds a minimum of an additional 2 feet of horizontal clearance for new construction.

c) Provide a demonstration detailing how the project will be in compliance with the current NESC including information such as how the ROW will be adequate with NESC requirements.

The ROW width for the proposed project is governed by the conductor displacement due to wind with the assumption that buildings can be erected on the property line regardless of local municipality building setback requirements. A ROW width of a minimum of 150' is provided for the proposed new overhead line segment where both circuits are supported on a dual circuit structures. At the tie-in location the circuits split and are supported on independent structures. The ROW expands to 224' at the 220-39 tie-in location and 223' at the substation tie-in. This exceeds the requirements of the NESC and PECO's Engineering Practice EPP-2090 "OHT Design Clearances" and will provide access for line maintenance, repair and vegetation management.

- d) Please provide information describing how PECO's design specifications and safety rules meet or surpass the requirements specified by the NESC for transmission lines.

Per PECO's Engineering Practice EPP-2090 OHT Design Clearances, Section 6.2, all new transmission line designs require an additional PECO safety clearance margin to be added to the NESC clearance requirements. The margins are:

3'-0" for vertical clearances
2'0" for horizontal clearances

For lines 230 kV and above PECO adds the following robust design criteria requirements above NESC requirements per PECO's Engineering Practice EPP-2030 OHT Weather and Design Conditions :

- Heavy Ice and Wind Loading Condition – Line voltage 230kV and greater. Wind pressure applied to the iced conductors shall be 8psf with 1.00 inch radial ice and temperature of 0_F. Load factor is 1.25.
- Extreme Wind Loading Condition . Line voltage 230kV and greater. Wind pressure applied to the wires shall be 25psf. The ambient temperature is to be 60_F. The wind pressure applied to the structure shall be 31.25psf. Load factor is 1.00.
- Heavy Ice Loading Condition . Line voltage 230kV and greater. Radial ice thickness on the wires only is to be 1.50 in. No wind pressure. Temperature is 32_F. Load factor is 1.00.

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 2: What is the height of the existing poles near the new poles or structures that will be installed? Provide the location and footprint of the proposed structures.

PECO Response to Data Request 2:

The proposed line section will tie into PECO's 220-39 line between structures 287 and 287A. Structure 287 is 90' tall and structure 287A is 97' tall. The new structures will be located at the following coordinates:

	<u>(X) Easting (ft)</u>	<u>(Y) Northing (ft)</u>	<u>Foundation Footprint</u>
Structure 0-1E	2620857.14	185328.13	2x 9' diam fdn spaced 24' apart
Structure 0-1W	2620793.63	185288.72	2x 9' diam fdn spaced 24' apart
Structure 0-2E	2620974.21	185144.94	2x 9' diam fdn spaced 24' apart
Structure 0-2W	2620906.92	185104.31	2x 9' diam fdn spaced 24' apart
Structure 0-3	2621136.44	184853.96	single 11' diam foundation
Structure 0-4	2621393.62	184411.36	single 11' diam foundation
Structure 0-5E	2621547.40	184277.68	single 11' diam foundation
Structure 0-5W	Inside new PECO substation		2x 6' diam fdn spaced 44' apart
Structure 0-6	261749.02	183948.65	single 11' diam foundation
Structure 0-7	Inside new PECO substation		2x 7' diam fdn spaced 44' apart

Please also See Attachment 2, Easement Plan, which shows the location of the proposed towers. Attachment 2 is a PDF that is more easily readable in expanded form; an expandable electronic copy is thus being provided to Staff by separate email.

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 3: Please provide a copy of any comments received from state or local officials.

PECO Response to Data Request 3:

As part of its public outreach for this project, PECO had discussions with the Borough of Marcus Hook and Lower Chichester Township. In addition, copies of the Letter of Notification were served on the relevant governing agencies within both municipalities. No comments have been received.

PECO also served copies of the Letter of Notification on the Pennsylvania Department of Transportation, the Pennsylvania Department of Environmental Regulation, and the Historical and Museum Commission. No comments were received.

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 4: Please serve a copy of the application on the Delaware County Planning Commission, and Delaware County Commissioners.

PECO Response to Data Request 4:

A copy of the Letter of Notification will be served on those entities contemporaneously with the filing of these data request responses.

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 5: Please provide the right-of-way width and the location of the proposed HV line within each city, borough, town and township traversed. Exhibit A filed with the LON application does not identify which is the underground line to be replaced or the proposed aerial line.

PECO Response to Data Request 5:

The proposed construction is to add a 0.35 miles line section to tie-in a new substation to the existing 220-39 line. The ROW for the project scope is located in Marcus Hook Borough and Lower Chichester Township. In general, the right-of-way will be a minimum of 150' in width. Please see response to Data Request 1(c) and Attachment 2 for additional detail on ROW width and location of line.

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 6: If applicable, what is the PJM project ID No. for the proposed project? Has this project been submitted to the PJM Transmission Expansion Advisory Committee (TEAC)? If so, please provide a description of the project as submitted to the TEAC. If this project is part of a larger project, explain in detail the larger project of which the instant LON is a part. Please describe how this project will mitigate potential planning criteria violations.

PECO Response to Data Request 6:

Post Substation is a Distribution project and not requested by PJM. The transmission interconnection of the Substation to transmission grid thus does not have a PJM project ID.

PJM was notified about this supplemental project via e-mail on 04/20/2015. PJM designated this project as a supplemental project with project number id s1002. PJM has not presented this distribution supplemental project in any of the TEAC meetings May-September 2015

PECO Energy Company
Letter of Notification for Post Substation Transmission Connection
Docket No. A-2015-2496384
PECO Energy Company's Response to Staff Data Requests

Data Request 7: Provide a breakdown of project costs. Please explain who will own, finance and build the proposed project. Please provide copies of any applicable Affiliated Interest Agreements.

PECO Response to Data Request 7:

Total estimated cost for Post substation transmission line extension is \$8.0M, which breaks down as shown below:

- Material cost- \$2.2M
- Electrical Installation cost- \$2.0M
- Civil Installation cost- \$1.2M
- Design Engineering cost- \$0.6M
- Contingency- \$0.8M
- Overheads & Indirects- \$1.2M

PECO will own, finance, and build the proposed project. There are no applicable Affiliated Interest Agreements.

VERIFICATION

Re: Letter of Notification of PECO Energy Company for Construction of 230 kV Transmission Facilities to Connect the Post Substation to the Transmission Grid in the Borough of Marcus Hook and Lower Chichester Township, Delaware County, Pennsylvania, Docket No. A-2015-2496384

I, Edward J. Veneziale, Manager of Project Manager for PECO Energy Company, hereby state that the facts set forth above are true and correct to the best of my knowledge, information and belief, and that I expect to be able to prove the same at any hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

E. J. Veneziale

Edward J. Veneziale

Manager, Project Management

PECO Energy Company

9-23-15

Date