

PJM RTEP – 2017 RTEP Proposal Window #1

Project Proposal Report

**Project G: New 230 kV line from Delmarva’s Edge Moor
Substation to a new PECO substation near Linwood
by**

**Exelon Corporation, on behalf of its
subsidiaries Delmarva Power and Light
Company and PECO Energy Company**



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A. Executive Summary

Exelon Corporation (Exelon), on behalf of its affiliates Delmarva Power & Light Company (Delmarva) and PECO Energy Company (PECO), is submitting this project proposal in response to PJM RTEP – 2017 RTEP Proposal Window #1, issued by PJM on July 11, 2017.

This proposal is to address the summer generation deliverability violations identified by PJM as flowgates GD-S798 (Claymont-Linwood 230 kV line) and GD-S815 (Edgemoor-Claymont 230 kV line). The contingency associated with both flowgates is PECO_P4_LINWO225 (stuck breaker #225 at Linwood substation). The proposed project would span the Delmarva and PECO zones.

The proposed project is to build a new 230 kV line connecting Edge Moor substation (Delmarva) to a new substation in PECO territory that would be built near Linwood substation. The new line would be 7.4 miles in length. The new substation would also be connected to an existing 230 kV line. At Edge Moor substation, a new circuit breaker would be added to the existing 230 kV bus to create a position to attach the new line. The estimated cost of the proposed project is \$36.575M (present year) or \$39.524M (in-service year) and the estimated in service date is 6/1/2022.

This proposal will also address the summer generation deliverability violations identified by PJM as flowgates GD-S591 (DuPont Edgemoor-Silverside 69 kV line) and GD-SNew 6 (Darley-Naamans 69 kV line). The contingency associated with both flowgates is DPL_P7_1_DBL_5NC (Edgemoor-Claymont and Edgemoor-Linwood double circuit tower outage).

Exelon and its public utility affiliates seek and anticipate being designated to build, own, operate and maintain all referenced facilities and associated enhancements. This proposal may be considered as a whole or in portions as PJM deems appropriate.

B. Company Evaluation Information

Exelon and its public utility affiliates are pre-qualified for designated entity status with PJM ID 13-04.

The Exelon companies currently own approximately 11,770 miles of transmission in PJM and have planned, constructed, maintained, and operated transmission from the early 1900s. Exelon has extensive experience constructing, operating, and maintaining transmission assets in adherence to standardized construction, maintenance and operating practices. Exelon and its public utility affiliates have executed the Consolidated Transmission Owners' Agreement and each of the Exelon utility companies are NERC registered Transmission Owners with federally mandated reliability obligations.

As discussed in the prequalification documents and highlighted below, Exelon is uniquely qualified in the engineering and design, development, construction, operation, and

maintenance of transmission facilities. Exelon has unique knowledge of the transmission systems in the area in question, extensive familiarity with the communities served by its public utilities, experience in building, maintaining, and siting transmission facilities in these communities, and access to capital and resources necessary to fund the construction and maintenance of new and existing transmission facilities.

Each Exelon Utility has an internal Real Estate Department dedicated to identifying, procuring, and managing company real property assets, to include fee-owned properties, transmission and distribution rights-of-way, and other miscellaneous excess properties. The Real Estate Department coordinates closely with Exelon's Transmission Planning organization and with other functional groups within Exelon, such as those dedicated to Engineering, Environmental, Governmental Affairs, and any needed external firms in order to verify existing rights-of-way or acquire new rights-of-way and real property interests necessary to advance pending projects, as well as to sustain, modify, and improve existing facilities. Additional details and specific examples of Exelon's capability with respect to the acquisition of rights-of-way can be found in Exelon's pre-qualification documentation.

Exelon has internal and external contracting capability to support restoration efforts, including during extreme events. For example, during Superstorm Sandy, Exelon was able to leverage its geographically diverse workforce to assist its sister utilities in emergency restoration. With its employees, contractors, and suppliers responsive on a 24-7-365 day a year basis, Exelon is prepared to address any and all potential emergencies and equipment failures on the high voltage transmission system. Incident drills are held on a routine basis. Planning for potential large scale storms and emergencies begins as soon as the weather forecast indicates the potential for an incident. Finally, Exelon maintains a robust Incident Management Plan, as part of which employees are expected to fill second roles during system emergencies with the goal of restoring the electric system as soon as possible.

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C. Proposed Project Constructability Information

This project includes the construction of a new 230 kV line connecting Edge Moor substation (Delmarva) to a new substation in PECO territory that would be built near Linwood substation. The new substation would also be connected to an existing 230 kV line. At Edge Moor substation, a new circuit breaker would be added to the existing 230 kV bus to create a position to attach the new line. The project has a total estimated cost of \$36.575M (present year) and \$39.524M (in-service year) and will resolve the posted violations identified as flowgates GD-S798 and GD-S815. Exelon and its public utility affiliates seek and anticipate being designated to build, own, operate and maintain all listed facilities and associated enhancements.

The estimated in-service date of the project is 6/1/2022. Delmarva and PECO will evaluate options to expedite construction to meet an earlier service date, if requested to do so by PJM.

A map of the proposal and a detailed breakdown of all proposal elements is contained in Appendix A.

Exelon will leverage dedicated internal and external support for real estate and permitting needs to procure needed additional right-of-way and support permitting and public approval. Varying iterations of property management practices are used to best preserve corridor integrity and maximize complimentary uses, to include; leasing fee simple interests, licensing easement interests, and managing encroachments to ensure compliance with all applicable standards, safety codes and environmental and governmental regulations.

Exelon will review required transmission and generation outages and congestion will be minimized using a variety of methods including opportune scheduling.

D. Analytical Assessment

Single line diagrams of the proposed project can be found in Appendix B. The analytical details have been included in the enclosed PSS/E .idev file.

Delmarva and PECO performed an analysis of the summer generation deliverability violations identified as flowgates GD-S798 (Claymont-Linwood 230 kV line) and GD-S815 (Edgemoor-Claymont 230 kV line) for the contingency PECO_P4_LINWO225 (stuck breaker #225 at Linwood substation). The analysis included simulations of power system conditions using the computer programs PSS/E from Siemens and TARA from PowerGem in conjunction with the PJM supplied input data. An initial assessment was performed to replicate the identified system conditions and fully understand the problem. Many alternative solutions were developed based on anticipated performance in alleviating the problem. Each potential solution was tested for actual performance using the simulation programs. The NERC criteria as well as local transmission owner criteria were also applied to each of the alternatives to ensure that new problems would not be introduced by the potential solution.

Based on the analysis performed, Delmarva and PECO are submitting this proposal for a project to construct a new 230 kV line from Edge Moor substation to a new substation to be built near Linwood substation. The new substation would also connect to an existing 230 kV line. This project would solve the identified problems on flowgates GD-S798 and GD-S815. It would also solve the identified problems on flowgates GD-S591 and GD-SNew 6. There were no other problems identified as being introduced to the system and the project would add significant capacity on the 230 kV lines between Edge Moor and Linwood.

E. Cost

The estimated capital cost of the proposal is listed in the summary above. The provided project costs include all direct and indirect costs related to the project. The project costs do not include AFUDC or estimates for contingencies. The in-service year costs provided at PJM's request are representative and based on a default inflation rate of 2.7%, and an assumed typical project cash flow. Upon PJM request, Exelon will refine these estimates using detailed annual cash flow and equipment specific rates.

A detailed project cost estimate is contained in Appendix C.

Exelon and its public utility affiliates have developed a robust cost containment strategy for the proposed project. The components of this strategy leverage extensive design, construction and permitting experience in the regulatory jurisdictions governing these facilities.

A full proposed Cost Containment Strategy is submitted in Appendix D.

F. Schedule

The estimated in-service-date is listed in the summary above, and assumes a timely approval process.

A detailed project schedule is included in Appendix E.

G. Operations/ Maintenance

The Exelon Companies have fully staffed and industry leading internal Transmission Engineering, Substation Engineering, Project Management, Transmission Planning, Transmission Operations, Transmission and Substation Maintenance, Overhead and Underground Line Operations and Maintenance and Real Estate departments to provide all of the necessary design, construction, maintenance and planning to competently maintain and operate the transmission system. The Exelon Companies are supported by the necessary consultants and contractors to augment the internal workforce that supports all Exelon Companies, to successfully manage and complete all capital projects, maintenance tasks and system restoration activities necessary.

A detailed maintenance cost estimate is contained in Appendix C.

APPENDIXES A – E HAVE BEEN REDACTED TO PROTECT PROPRIETARY AND CEII INFORMATION