

An Exelon Company

Dennis P. Jamouneau Assistant General Counsel

EP9628 701 Ninth Street NW Washington, DC 20068-0001 Office 202.872.3034
Fax 202.331.6767
pepco.com
djamouneau@pepcoholdings.com

May 17, 2018

Mr. Daniel W. Durbak
Siemens Industry, Inc.
Energy Management Division
Digital Grid Solutions & Services
Siemens Power Technologies International
400 State Street, Schenectady, NY 12305

Re: Siemens PTI 2018 Technical Audit

Dear Mr. Durbak:

Enclosed are Potomac Electric Power Company's responses to the Siemens PTI Data Request Set No. 1 in the referenced proceeding.

Please feel free to contact me if you have any questions regarding this matter.

Sincerely,

Dennis P. Jamouneau

Enclosure

cc: All Parties of Record

QUESTION NO. 1

The detailed Manhole Event Report in electronic (xls) format for the year 2017.

RESPONSE:

See FC PEPMIR Siemens PTI DR 1-1 Attachment, filed electronic only.

QUESTION NO. 2

The inches of precipitation in DC for each month of year 2017.

RESPONSE:

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2017	2.61	0.68	3.32	2.62	5.55	1.13	9.15	4.53	1.43	2.02	2.00	0.50

QUESTION NO. 3

At year-end 2017, the number of the following facilities in the DC underground system:

- a. Distribution system manholes
- b. Network transformer vaults
- c. Transmission system manholes (69 kV and above)

RESPONSE:

- a. Distribution System Manholes: 59,519
- b. Network Transformers: 4,431c. Transmission Manholes: 817

QUESTION NO. 4

An electronic spreadsheet listing all manhole inspections performed during the Phase III Manhole Inspection Program through year-end 2017. Include the following data columns:

- a. Grid number
- b. Date of inspection
- c. Reportable Condition (Yes/No)

RESPONSE:

See FC PEPMIR Siemens PTI DR 1-4 Attachment, filed electronic only.

QUESTION NO. 5

The number of long and short inspections of network transformer vaults performed during year 2017 (not included in the Phase III Manhole Inspection Program).

RESPONSE:

In 2017, 1,743 long inspection orders were completed. In 2017, 313 short inspection orders were completed. Each location includes an order for the network protector and an order for the transformer individually.

QUESTION NO. 6

Provide the anticipated date of completion for the Phase III Manhole Inspection Program.

RESPONSE:

As stated at the data request interviews with Siemens, the manhole inspection scheduling has moved to the updated geographical scheduling approach as of January 2018. Geographical analysis of previous years' inspections determined the area to start for 2018 so that the program stays within cycle. 2018 can also be considered Year 1 for the refreshed geographical approach of 2018-2023.

QUESTION NO. 7

What is the status of the proposed geographic/scheduling approach for the next phase of the Manhole Inspection Program? Describe how it will work and the expected benefits of its implementation.

RESPONSE:

The improved scheduling and tracking process based on geographical manhole population density has begun as of January 2018. The advanced scheduling of the work areas has many benefits for crew productivity and work scheduling. It will also allow for proper and efficient corrective maintenance planning and allow data for large areas to be analyzed.

QUESTION NO. 8

To what extent has the use of 360 degree photography been implemented in the manhole inspection program?

RESPONSE:

Three hundred-sixty-degree photography has been completed during a pilot program for the manhole assessment program. The updated contractor specification for the manhole assessment program requires 360-degree photography during manhole inspections, and is currently out for bid.

QUESTION NO. 9

Discuss whether any quantitative and qualitative benefits have arisen from the transfer of the Manhole Inspection Program to the Distribution Standards Department from the UG Maintenance & Construction Department.

RESPONSE:

The transfer of the ownership of the manhole inspection program from the UGM&C group to the Distribution Standards Engineering department has been very beneficial to the Company both analytically and operationally. The first major update was moving from a "plat" inspection area to a single manhole to manhole record system for inspections. This change ensures that every single manhole in our GIS system is accounted for during an inspection cycle. Additionally, the new geographical approach for the inspection cycle will help with crew productivity, ensuring less travel time between jobs. It will also allow corrective maintenance work to be planned and executed more efficiently in the future. The most beneficial benefit of the new program ownership is a new assessment program scope of work and specification. This new specification includes updated processes and best practices per work with the industry peer groups as well as other Exelon Utility peer groups. The Engineering Standards group follows the Exelon model Governance, Oversight, Support, Perform for program ownership (GOSP). In this program the engineering standards group owns the Governance and Oversight, while also providing support to field resources while they perform and execute the work per the specification.

QUESTION NO. 10

When is the 2018 refresher training for manhole inspectors going to be conducted?

contract award of the program re-bid. This training will be completed and developed per the details outlined in the program specification.

QUESTION NO. 11

What if any inspection training program revisions are anticipated as a result of improvements or changes planned for the Manhole Inspection Program?

RESPONSE:

Per the updated specification, all contractor training materials will be developed by the training department of the approved contractor, with help from Pepco. Pepco shall review and approve all training materials prior to the contract start date. Inspector training will include both classroom training materials including reference books and PowerPoints as well as on the job/field training facilitated by the contractor. Pepco will review all documents before approving contractor training and requires the contractor to perform yearly refresher training per Pepco's specifications. Yearly training sign-off sheets will be provided to Pepco for all employees on the system. New employees must complete all associated trainings before being certified as an inspector.

QUESTION NO. 12

What, if any, best practices of other Exelon operating utilities regarding manhole inspection program elements have been adopted and implemented for the ongoing Phase III Program?

RESPONSE:

Pepco has not yet implemented Exelon manhole inspection program elements as the legacy contracts are still in force. All updates to the program come into effect with the revised specification, currently out for bid.

QUESTION NO. 13

What is the status of Pepco's plans to revise its manhole inspection repair priority schedule to conform to that used by all other EU operating companies? What are the expected benefits, if any?

RESPONSE:

The revision of the corrective maintenance repair deficiencies will come with the assessment program re-bid. Benefits include better classification and documentation of defects. Repair priorities will be classified into Exelon Utility standards to fit into the work management process which drives the proper execution and prioritization of corrective maintenance work.

QUESTION NO. 14

Failure analysis reports for all DC underground distribution transformer failures in year 2017.

RESPONSE:

See FC PEPMIR Siemens PTI DR 1-14 Attachment for the analysis of failures prepared in 2017.

Title	Network Transformer buried by construction debris	NETWORK TRANSFORMER PRIMARY SWITCH FAILURE	Network Transformer secondary protection failure	Network Transformer Failure	Network Transformer
Description	While clearing construction site and performing demo work, contractor excavated and dumped site debris into MH. Assessed damage by Pepco Claims dept included 3ph network transformer, primary and secondary cable. 6/13/2017 11:00 Property damage report and follow up completed by Pepco Claims Dept.	It is the opinion of Quality Switch that an arc between the switch and the front plate of the chamber occurred with some fluid present. The causes of that arc would most likely be a result of contaminated dielectric fluid. It is possible that fluid was leaking from the bottom of the chamber front plate or an area down in the right hand area. This would result in a loss of fluid over time. As the load changed, as the temperature changed, the fluid would expand and contract to some degree. If, during a drop in loading, or a simultaneous occurrence of both, a vacuum	Network circuit 14596 tripped, Reported Jargets of AD, CØ and ground instantaneous. Reported MMH smoking as december and Spring St. UG reported secondaries burned at the spades of the protect at 8750 Georgia Annual Colli UG advised. FO&R reported protector at 8750 Georgia Annual Colli UG advised. FO&R reported protector at 8750 Georgia Annual Assistation and a spring of the replaced. UG reported secondaries are cut in the clear and protector handle is open at 8750 Georgia Annual Assistation and Assistatio	Network transformer fault at the primary switch compartment. No conclusive evidence from failure analysis.	Damage was observed in the protector due to excessive heat and an arcing fault. The origination of the damage appeared to be between the B and C phases of the breaker, it was noted that the protector was recently serviced and the motor was replaced a couple of months prior.
Created	6/13/2017 11:00	7/10/2017 16:16	8/22/2017 11:09	8/22/2017 1153	11/28/2017 10:59
HumanPerformance	FALSE	FALSE	FALSE	FALSE	FAISE
Address	13th Street NW near F St.	1263 First St SE	8750 Georgia Ave.	800 N. Capitol St.	515 New York Ave.
Facility ID	791386-365017	798379-023549	791423-826552	796389-447675	801392-980527
Failed Equipment Type	NETWORK TRANSFORMER 791386-365017 13th Street NW near F St.	NETWORK TRANSFORMER 798379-023549 1263 Fl41 St SE	NETWORK TRANSFORMER 791423-826552 8750 Georgia Ave.	NETWORK TRANSFORMER 796389-447675 800 N. Capitol St.	NETWORK TRANSFORMER B01392-980527 515 New York Ave.
Feeder 1D		15598	14596	15467	14020
Failure Date	5/29/2017 11:00	7/7/2017 18:00	8/10/2017 11:00	8/13/2017 12:00	11/16/2017 11:00

QUESTION NO. 15

Provide a listing of DC underground distribution transformer maintenance issues found, including corrosion percentages, as a result of the year 2017 long and short inspections.

RESPONSE:

A listing of transformer maintenance records is not currently available as issues are noted on paper inspection records performed in the field. The network transformer inspection program is also being revised per Engineering Standards and all records are being digitized. Additionally, the inspections are moving to an electronic platform to facilitate the data analysis required by engineering. Please contact Dennis Jamouneau at 202-872-3034 to view these records onsite.

QUESTION NO. 16

All failure analysis reports prepared for manhole explosions and fires during year 2017.

RESPONSE:

See FC PEPMIR Siemens DR 1-16 Attachment for the analysis of failures prepared in 2017.

Callure Date	Cander ID	Manhole Fuent Tune	Callure Date Candar ID Manhole Fuent Tune Esiled Fourinment Tune	Facility ID	Address	Description	Title
				789400-342067	1611 Park RD NW	Secondary insulation deterioration at a branch joint. Crews re-taped the joint and made permanent repairs.	Failed secondary
1/2/2017	14/23	Explosion	Secondary Cable				
				804382-610645	NEC 15TH & D ST SE	FIRMATY FALL ON & DESCRIPTION OF STREET OF LIVE TAN FOCUST. I SINGLE STREET OF COLUMNIC	Equipment railure
1/3/2017	00208	Fire	Failed Cable Accessory 3ph Air switch			cause of deadbreak module due to damage.	
l	١			788386-66795	17th and E St		Failed Secondary
_						Insulation deterioration in the duct line of two sets of 250km secondary cable. Fire propagated to adjacent manholes	
4/26/2017	15373	Fire	Secondary Cable			and crews were able to isolate faulted sections and make repairs.	
1				792383-121879	11th and 1000 Independence Ave SW	Primary joint failure, Paper lead cable. High system fault current and incident energy caused a fire on the primary	PILC Joint Failure
4/25/2017	15299R	Fire	Primary Joint			cable and smoke from the manhole. Fire extinguished before crew arrival.	
1	i .			785390-328707	1201 24 St. NW		Primary tape joint failure
6/8/2017	14544	Fire	Primary Joint		_	insualtion. Fire was self extinguishing and no further damage noted besides the primary feeder that faulted.	
1				793391-948074	631 N Street, NW	Manhole fire due to secondary main insulation deterioration within the duct system. Small fire spread from conduit [Failed secondary cable	Failed secondary cable
11/16/2017 15326		Fire	Primary Cable and Secondary Cable			to adjacent manhole where it burned through primary cable jacket insulation causing a feeder to trip as well.	:
				799393-341984	3rd Street and T Street, NE	Primary lead joint failure blew the feeder in half. High system fault current and incident energy caused damage to the Trifurcating Joint	Trifurcating Joint
11/18/2017 15459	15459	Fire	Primary Joint			PILC and caused the joint to slightly burn and smoke	
				790389-356372	14th and K Street	1W/3W lead joint faulted at 14th and K St. High system fault current caused slight dislodge of manhole cover due to Lead 1 way/ 3 way Joint	Lead 1 way/ 3 way Joint
12/12/2017 14368		Explosion	Primary Joint			air expansion from fault.	
in the same							

QUESTION NO. 17

How did the Company achieve its reduction the DC CAIDI results from 2.35 hours in 2016 to 1.74 in 2017 versus?

RESPONSE:

The ratio of SAIDI to SAIFI improved by approximately 36%. See also the response provided to Siemens PTI DRs 1-18 and 1-20.

QUESTION NO. 18

Discuss whether any quantitative and qualitative benefits have arisen from the creation of two "Fix It Now" teams. Address the impact, if any, on service restoration time (CAIDI).

RESPONSE:

The "FIN" (fix it now) teams have been extremely beneficial to the company and are in integral part of the overall work management process. Having these crews available to complete all emergent work has decreased the duration of customer outages while also benefitting new customers because crews do not have to be pulled off of new construction work to assist with a failure.

QUESTION NO. 19

What is the status of Pepco testing the use of Temp Power portable generators in to supply customer loads while UG cable repairs are being made?

RESPONSE:

In 2017 Pepco deployed generation in multiple instances both for scheduled work and for emergent outages. Pepco has also purchased four portable generation units to respond to future outages and scheduled work on an as needed basis.

QUESTION NO. 20

Discuss whether any quantitative and qualitative benefits have arisen from increasing trouble staffing to 2 crews on all 3 shifts.

RESPONSE:

The increased trouble crews have been a great benefit as the crews are directly available for trouble support. The trouble crews are part of the reason Pepco experienced significant CAIDI reduction duration as a chunk of Pepco's CAIDI reduction is in time taken getting to the jobsite, which is easier with a dedicated trouble crew.

QUESTION NO. 21

Provide quantitative information regarding attainment of Pepco's previously stated staffing commitments and plans:

- a. Did the Company satisfy its merger commitment requirement of adding 102 union employees, per Order No. 18148, by March 2018?
- b. Did the Company achieve its planned increase in UG classifications from 230 full-time equivalents (FTEs) to 250? In this regard, provide detailed staffing increases including the number of cable splicers, distribution testers, and increased staffing in the transformer shop and hi-voltage distribution group.

RESPONSE:

a. In accordance to Paragraph 141 of Attachment B of the Order, Pepco exceeded its commitment to hire 102 union employees by hiring 145 employees in the District of Columbia within the two (2) years after merger closing date from March 24, 2016 through December 31, 2017.

For additional details, please see: https://edocket.dcpsc.org/apis/pdf_files/3e43531c-1ad8-4705-a933-82e142bdb98a.pdf

b. Yes.

Cable splicers: 28 Distribution testers: 5 Transformer shop: 14

QUESTION NO. 22

During year 2017, how many feeders were tested with the new hi-pot tool? What were the results of those tests?

RESPONSE:

The hi-pot tool was received in late December 2017 and was discovered to have been constructed out of specification with Pepco's original request. Pepco is still negotiating to have the necessary changes made.

QUESTION NO. 23

To what extent has the Company implemented a remote cutting initiative to cut high voltage cables without personnel in the manhole? Have any benefits been experienced in terms of improved worker safety and faster repair times?

RESPONSE:

Exelon Utilities (EU) have developed and implemented, and Pepco adopted, a remote cable cutting initiative on all primary cables. This was an EU and industry best practice and is a process that is followed for 100% of primary cable first cuts. Worker safety is a top priority and this procedure guarantees that no employees are put in danger during the first cut on primary feeders.

QUESTION NO. 24

What is the status of the Company's submission of a proposal to the National Electric Energy Testing Research Application Center (NEETRAC) to test the effectiveness of various arc proof/fire retardant tape products?

RESPONSE:

The NEETRAC project that Pepco proposed is currently approved and kicked off as of May 2018. The project is an in-depth study to evaluate the effectiveness of different products on protecting medium voltage cables from sources of fire. There are currently 13 major utilities and other vendors involved in the project. NEETRAC data is proprietary.

QUESTION NO. 25

What is the status of Pepco's indicated interest in determining systematic PILC replacement opportunities in addition to the opportunistic PILC replacement strategy currently employed by the Company? (This would be determined by analysis and assessment of failure data along with cost/benefit considerations.)

RESPONSE:

A systematic PILC replacement program and project plan is currently still in the development stage.

QUESTION NO. 26

What is the status and results of Pepco's pilot testing of the 3% (by area) vented manhole covers in DC?

RESPONSE:

Pepco has acquired the first shipment of newly designed 3% vented manhole covers as a result of the Exelon Utility peer group dedicated to the mitigation of manhole events. The initial technical bulletin has been issued to field crews and designers to describe the product and guide the usage of these covers. None of these manhole covers have been installed in the field to date. Pepco plans to present updates on the program in its Annual Consolidated Report. Upon installation, Pepco will keep record of where these covers are placed.

QUESTION NO. 27

Provide a listing and status of all current and planned pilot programs related to the DC underground system.

RESPONSE:

Current Pilots: 13kV automated interrupter switch with motor operators and SCADA control.

New standards released and to be released: Cold shrink secondary joints, 600kcm flat strap mainline cable, cold shrink primary joints, network secondary disconnect switches.

QUESTION NO. 28

Provide updates on the status of the following initiatives:

- a. Implementation/installation status through year 2017 of the remote monitoring system (RMS) for network transformers
- b. The number of sacrificial anodes installed during year 2017 in the DC underground system
- c. The number of anode installations still needing to be performed, and time frame for their completion
- d. The number of feet of PILC replaced by solid dielectric cable during year 2017
- e. The number of 4 kV UG feeders converted to 13 kV during year 2017
- f. The number of 4 kV UG feeders remaining in the District at year-end 2017
- g. The number of 4 kV UG feeders planned to be converted in next 10 years

RESPONSE:

a. See below.

RMS Network Group	Substation Name	No of Transformers in Network Group	No of Transformers with RMS Installed	No of Transformers EMS Integrated
Sta. "B" East	Buzzard Point	50	50	50
Sub 212 SE	Northeast	47	47	47
Sub 18 Central	Southwest	72	72	72
Sub 7	Benning	75	75	75
Sub 212 South	Northeast	80	76	71
Sub 161 South	New Jersey Ave.	86	76	73
Sub 25	Champlain	60	42	30
Sub 52 West	10th Street	81	58	0
Sub 52 South	10th Street	59	35	0
Total		610	531	418

- b. In 2017, 2,040 anodes were installed on submersible transformers in Pepco.
- c. Anode installations are done at the time of preventative maintenance inspections on network transformers. Therefore, there is no backlog of anode installations.
- d. As provided in the consolidated report, Pepco replaced 37,210 feet of PILC with solid dielectric cable in 2017. This accounts for failure replacements and planned replacements.
- e. Eight 4 kV feeders were converted to 13 kV during year 2017.
- f. Twenty-seven 4 kV feeders remained in the District at year-end 2017.
- g. Twenty-four 4 kV feeders are planned to be converted in next 10 years.

CERTIFICATE OF SERVICE

I hereby certify that a copy of Potomac Electric Power Company's responses to the Siemens PTI Data Request Set No. 1 was served this 17th day of May 2018 on all parties in Formal Docket PEPMIR by electronic mail.

Ms. Brinda Westbrook-Sedgwick Commission Secretary Public Service Commission of the District of Columbia 1325 G Street N.W. Suite 800 Washington, DC 20005 bwestbrook@psc.dc.gov

Sandra Mattavous-Frye, Esq. People's Counsel Office of the People's Counsel 1133 15th Street, NW Washington, DC 20005 smfrye@opc-dc.gov

Daniel Durbak
Siemens Power Transmission
& Distribution, Inc.
400 State Street
PO Box 1058
Schenectady, NY 12301
daniel.durbak@siemens.com

Herbert Harris, Chairman DC Consumer Utility Board 1133 15th Street NW, Suite 500 Washington, DC 20005 dccub@msn.com

Donald Hayes
Director of Regulatory Matters
Washington Gas Light Company
101 Constitution Avenue, NW
Washington, DC 20080
dhayes@washgas.com

Brian J. H. Lederer, Esq.
International Brotherhood of Electric Workers (IBEW)
Local 1900
3003 Van Ness Street, NW
Suite W228
Washington, DC 20008
brian.lederer@att.net

Bernice K. McIntyre, Esq. Washington Gas Light Company 101 Constitution Avenue, NW Washington, DC 20080 bmcintyre@washgas.com

Brian Caldwell, Esq.
Office of the Attorney General
for the District of Columbia
441 4th Street, NW
Suite 450 North
Washington, DC 20001
brian.caldwell@dc.gov

Christopher Lipscombe, Esq. General Counsel Public Service Commission of the District of Columbia 1325 G Street N.W. Suite 800 Washington, DC 20005 clipscombe@psc.dc.gov

Dennis P. Jamouneau