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May 1, 2018

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

Re: Formal Case No. 766 and PEPADTR

Dear Ms. Westbrook-Sedgwick:

In accordance with Order No. 15101, issued November 3, 2008, Potomac Electric Power Company hereby submits its Annual Distribution Transformer Report in the referenced proceeding.

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

Sincerely,

A handwritten signature in blue ink, appearing to be "DJ", with a stylized flourish extending to the right.

Dennis P. Jamouneau

Enclosure

cc: All Parties of Record

APPENDIX A

Potomac Electric Power Company 2017 Distribution Transformer Report

Formal Case No. 766

May 1, 2018



An Exelon Company

Appendix A

Distribution Transformer Report

Reporting Period: January 1, 2017 – December 31, 2017

In Accordance with Title 15 of the DCMR, Section 4302.1

- (a) The number of models of transformers in each capacity class or type that were evaluated during the reporting period:

Capacity Class or Type	Number of Models Purchased in 2017 a/
Single-Phase Transformers	
• Pad-mounted transformer	3
• Pole mounted transformer	6
• Sub-surface transformer	4
• Subway transformer	14
Three-Phase Transformers	
• Network transformer	12
• Pad-mounted transformer	15
• Sub-surface transformer	8

a/ In 2017, there were 62 transformer models evaluated by TOC and were purchased under the three-year blanket order contract.

- (b) The avoided cost of generation and transmission energy and capacity used in the life-cycle cost analysis;

Pepco Holdings, LLC, used these values to evaluate the lowest TOC for transformers as determined by the life cycle cost methodology.

- The avoided cost of generation = \$111.23 per kilowatt (kW)
- The avoided cost of transmission = \$20.84 per kW
- The avoided cost of capacity (distribution) = \$30.78 per kW

- (c) The estimated savings in energy and capacity resulting from the purchase of transformers in the year, compared with minimally efficient distribution transformers of the same capacity, class or type.

Capacity Class or Type	Estimated Savings in Energy (MW*HRS) c/	Estimated Savings in Capacity (MVA) d/
Single-Phase Transformers		
• Pad-mounted transformer	263	0.0317
• Pole mounted transformer	528	0.0635
• Sub-surface transformer	78	0.0093
• Subway transformer	418	0.0502
Three-Phase Transformers		
• Network transformer	3,911	0.4700
• Pad-mounted transformer	1,443	0.1735
• Sub-surface transformer	633	0.0760

c/ MW*HRS – megawatt hours

d/ MVA – megavolt-ampere

References:

NEMA TP 1-2002, Section 2, Page 4 – Total Owning Cost (TOC)

TOC = Transformer first cost + Cost of core loss + Cost of load loss

Transformer first cost = Cost of acquisition

Cost of core loss = A(\$/Watt) x core loss watts

Cost of load loss = B(\$/Watt) x load loss watts

where:

A = Equivalent first cost of no load losses (\$/Watt)

B = Equivalent first cost of load loss (\$/Watt)

NEMA TP 1-2002, Page 3 – Calculation for Efficiency Based on TOC (CEBTOC)

$$(\text{CEBTOC}) = 100 \times [(P \times kVA \times 1000) / [(P \times kVA \times 1000) + NL + (LL \times P^2 \times T)]]$$

where:

P = Per unit load = 0.50 for medium voltage liquid filled transformers

kVA = nameplate kilovolt-ampere rating

NL = Quoted no load (core) loss at 20°C in watts

LL = Quoted load at its full load reference temperature

T = Loss load temperature correction factor = 1 at 55°C

$$\text{ECS} = ((\text{CEBTOC} - \text{DOE TE}) \times \text{kVA}) / 1,000$$

$$\text{EES} = ((\text{CEBTOC} - \text{DOE TE}) \times \text{kVA} \times 8,760 \times \text{PF}) / 1,000$$

where:

ECS = Estimated Capacity Saving (MVA)

EES = Estimated Energy Saving (MW-HR per year)

CEBTOC = Calculation of Efficiency Based on TOC

DOE TE = DOE Transformer Efficiency issued April 18, 2013, Table I.5

kVA = Transformer Rating

PF = Power Factor (0.95)

8,760 hours/year = 24 hours/day x 365 days/year

CERTIFICATE OF SERVICE

I hereby certify that a copy of Annual Distribution Transformer Report was served this 1st day of May 2018 on all parties in Formal Case No. 766 and PEPADTR by electronic mail.

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