

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of	)	
Ohio Power Company for Authority to	)	Case No.-23-23-EL-SSO
Establish a Standard Service Offer	)	
Pursuant to §4928.143, Ohio Rev. Code,	)	
in the Form of an Electric Security Plan.	)	

In the Matter of the Application of	)	
Ohio Power Company for Approval of	)	Case No. 23-24-EL-AAM
Certain Accounting Authority	)	

DIRECT TESTIMONY OF
STEPHEN L. SWICK
IN SUPPORT OF AEP OHIO'S
ELECTRIC SECURITY PLAN

Filed: January 6, 2023

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STEPHEN L. SWICK

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BEFORE
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DIRECT TESTIMONY OF
STEPHEN L. SWICK
ON BEHALF OF
OHIO POWER COMPANY

1 **I. PERSONAL BACKGROUND**

2 **Q1. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION.**

3 A. My name is Stephen L Swick. My business address is One Riverside Plaza, Columbus,
4 Ohio 43215. I am employed by American Electric Power Service Corporation
5 (“AEPSC”) as Chief Security & Privacy Officer. AEPSC, a wholly owned subsidiary
6 of American Electric Power Company, Inc. (“AEP”), provides centralized professional
7 and other services to subsidiaries of AEP, which includes Ohio Power Company (“AEP
8 Ohio” or the “Company”).

9 **Q2. PLEASE DESCRIBE YOUR EDUCATIONAL AND WORK EXPERIENCE.**

10 A. I received a Bachelor of Science degree from Ohio University and have completed
11 numerous security certifications and an executive level targeted development program.
12 I joined AEP in 1998 as an Information Security consultant, brought in to elevate and
13 improve the AEP Information/Cyber Security program. Since joining AEP in 1998, I
14 have helped lead and build AEP’s cybersecurity program, serving in a series of
15 progressive management positions. Before joining AEP, I served as security and
16 intelligence expert with the U.S. Air Force for 10 years and was an original member of
17 the USAF Computer Emergency Response Team, and received two Commendation
18 Medals during my U.S. Air Force career.

1 Prior to being named to Chief Security Officer, I was the director of
2 Cybersecurity Intelligence & Defense. I was appointed vice president and chief
3 security officer for AEP on October 30, 2019. The office of the Chief Security Officer
4 is responsible for the Enterprise Security Program for the AEP Service Corporation and
5 all subsidiaries including AEP Ohio. The Enterprise Security Program is focused on
6 protecting all employees, contractors, and visitors as well as all AEP assets. That goal
7 is accomplished through a physical security program that provides physical protections
8 and training and a cyber security program that protects the AEP network and associated
9 hardware and software.

10 **II. PURPOSE OF TESTIMONY**

11 **Q3. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.**

12 A. My testimony explains the need for increased physical security upgrades across AEP
13 Ohio's service territory. Additionally, I will support the Company's plan to install
14 physical security upgrades at 137 distribution substations over the course of the ESP
15 period and the reasonableness of the costs to make those investments to the benefit of
16 customers.

17 **III. SECURITY TECHNOLOGY FOR DISTRIBUTION SUBSTATIONS**

18 **Q4. PLEASE PROVIDE AN OVERVIEW OF AEP OHIO'S PROPOSED**
19 **DISTRIBUTION SUBSTATION PHYSICAL SECURITY PLAN.**

20 A. Currently, AEP Ohio's distribution substations have varying levels of security. As a
21 general matter, AEP Ohio's distribution substations have basic security measures
22 including fencing, signage, and padlocks, while a limited set of substations have
23 rudimentary incursion detection systems installed. These protection measures provide

1 a basic level of security; however, to help ensure it can provide safe and reliable service
2 to its customers, the Company has identified the need to make proactive physical
3 security investments to harden its distribution substations.

4 Thus, as part of its Distribution Investment Rider (“DIR”) Work Plan, AEP
5 Ohio proposes to install modern intrusion deterrence and detection technology on 137
6 substations to protect critical distribution substations from theft and vandalism. By
7 hardening AEP Ohio’s security infrastructure in this manner, the Company will
8 improve the reliability of its distribution grid, reduce repair and maintenance costs
9 associated with thefts and vandalism, enhance the safety of both Company personnel
10 and the public at large, and improve customer satisfaction.

11 **Q5. WHY DOES AEP OHIO NEED TO IMPROVE THE SECURITY OF ITS**
12 **DISTRIBUTION SUBSTATIONS?**

13 A. AEP Ohio’s distribution and transmission substations face two principal threats: copper
14 theft and vandalism. With high copper prices in recent years, AEP Ohio has
15 experienced more than 250 incidents over the last eight years of individuals scaling or
16 cutting substation fences to steal copper wiring. AEP Ohio has also experienced more
17 than 50 additional acts of vandalism and other theft at its substations from 2017 through
18 2021. Over the last fourteen years, AEP Ohio customers have experienced nearly 17.7
19 million customer minutes of interruption (“CMI”) associated with vandalism and theft
20 at substations. In addition, the upgrades would also be designed to prevent acts of
21 malicious activity, such as acts of terrorism, that would interfere with the stations.

1 **Q6. WHAT HARM DOES COPPER THEFT AND VANDALISM CAUSE?**

2 A. Copper theft and vandalism create many problems. As an initial matter, both copper
3 theft and vandalism can disable substations and cause reliability issues for all customers
4 fed by a damaged substation. When copper wires are stolen from the substation, it can
5 take a long time for AEP Ohio to safely replace the stolen wires and restore service.
6 Likewise, certain types of vandalism can cause damage to station equipment that is
7 difficult and time-consuming for AEP Ohio to determine what equipment has been
8 damaged and to implement a repair plan.

9 Copper theft and vandalism also create safety risks. Would-be thieves have
10 been electrocuted and killed trying to steal copper from substations. The risk from
11 copper theft is not limited to the thieves: it extends to AEP Ohio's personnel and the
12 public. For example, AEP Ohio's substations are protected by a "ground grid," a
13 network of underground copper cable that provides grounding of the station equipment
14 and the station fence. The ground grid is a vital safety feature for personnel inside the
15 station and for the public. In the event of a fault on the electrical system, the ground
16 grid serves to disperse electrical fault current into the earth, "clearing" the fault, thereby
17 protecting systems and personnel. When copper thieves and vandals cut the ground
18 grid, this safety function is compromised. This means that system faults could possibly
19 energize substation equipment, including the substation fence. This creates the
20 possibility for serious risk to safety, either for AEP Ohio employees or the general
21 public. Anyone who approaches a substation – whether for business purposes or
22 through accidental conduct – may not realize that the ground grid has been
23 compromised and may be subject to a substantial safety risk, including members of the

1 public. While properly grounded fences typically pose no danger, when the ground
2 grid is disabled by copper theft or vandalism, the fence could be energized, posing
3 substantial risks to anyone who accidentally touches a substation fence.

4 Finally, copper theft and vandalism are costly to remediate. Re-grounding a
5 substation, for instance, is a labor-intensive task that requires crews to dig by hand
6 within the substation without the aid of heavy machinery. Also, it may require that all
7 power be shut off to the substation during repairs.

8 **Q7. PLEASE EXPLAIN THE CRITICAL ENERGY INFRASTRUCTURE RISK**
9 **ASSOCIATED WITH MALICIOUS ACTS TO DISTRIBUTION**
10 **SUBSTATIONS.**

11 A. The critical infrastructure risk associated with malicious acts to distribution stations is
12 high and needs to be addressed. As an example, a significant act of terror occurred on
13 April 16, 2013, on Pacific Gas and Electric Company's Metcalf Transmission
14 Substation in Coyote, California, near the border of San Jose. The attack, in which
15 gunmen fired on 17 electrical transformers, resulted in more than \$15 million worth of
16 equipment damage.¹ In addition, in February of 2022, three men plead guilty in Ohio
17 for conspiring to attack power grids throughout the country. Their objective was to fire
18 high-powered rifles on critical electrical equipment to disrupt the grid.² As the most
19 recent example, Duke Energy in North Carolina experienced a targeted attack where
20 suspect(s) fired weapons into two substations, in addition to breaching at least one

¹ Mitigating Active Shooting Incidents on the Bulk Power Grid - June, 2014,
<http://www.shotspotter.com/system/content/uploads/mediakit/Substation-Security-June-2014-v-5-5.pdf>.

² 3 men plead guilty to domestic terrorism crime related to plans to attack power grids | USAO-SDOH | Department of Justice, <https://www.justice.gov/usao-sdoh/pr/3-men-plead-guilty-domestic-terrorism-crime-related-plans-attack-power-grids>.

1 substation gate, that left approximately 45,000 customer without power.³ Upgrading
2 security measures to protect the critical energy infrastructure is imperative to protect
3 against these threats and provide reliable energy service to customers.

4 **Q8. HOW WILL AEP OHIO DETERMINE WHAT TECHNOLOGY TO INSTALL**
5 **AT EACH SUBSTATION?**

6 A. The Company will analyze and develop a list of critical substations at which intrusion
7 detection and deterrence technology will be installed, and the Company will develop a
8 technology deployment plan tailored to each substation's unique characteristics.

9 **Q9. HOW WILL AEP OHIO DETERMINE WHICH SUBSTATIONS WILL**
10 **RECEIVE THE UPGRADED SECURITY TECHNOLOGY?**

11 A. AEP Ohio will determine the critical substations to receive security technology based
12 on numerous factors, including:

- 13 • Number of customers connected to the station (i.e., the number of customers who
14 would experience an outage due to theft or vandalism);
- 15 • The criticality of the customers served from the distribution station (i.e., whether
16 the station serves hospitals, police stations, fire stations, wastewater treatment
17 facilities, etc.);
- 18 • History of theft and vandalism at the station;
- 19 • Existing security measures in place;
- 20 • Existing communication system availability at the station; and

³ 'Targeted' N.C. Power Outages Could Leave Thousands in the Dark for Days, NBC News (Dec. 4, 2022) (<https://www.nbcnews.com/news/us-news/nc-power-outages-investigated-criminal-occurrence-rcna59993>)).

- Distribution station load growth as an indicator that potential future construction activity may be taking place. With construction, there is an increase in activity and a higher risk of tools stolen from crews parking at the distribution station.

Q10. WHAT TECHNOLOGY IS AEP OHIO PROPOSING TO INSTALL TO HARDEN SUBSTATION SECURITY?

A. Technologies have been developed that would substantially improve the Company's ability to deter and detect theft and vandalism at substations. AEP Ohio proposes to install some or all of the following technologies at 137 of the most critical distribution substations:

- **Cameras** - Cameras will be installed to detect and monitor security incursions. Many substations have no theft detection system installed. Others have only rudimentary motion detection sensors that simply sends an alarm when it detects motion. This leads to many false alarms, and it does not provide security personnel any detail as to the nature of the security threat. AEP Ohio proposes to install cameras that can be controlled remotely by AEP Ohio personnel at a centralized security command center. Once a security intrusion alarm is received, AEP Ohio personnel will be able to switch among multiple cameras and to move cameras to investigate the nature of the alarm. This will allow AEP Ohio personnel to investigate what a potential thief has done – for example, whether the ground grid has been cut, what equipment has been damaged, or whether there are any other safety risks. This will not only give repair personnel the information they need to stay safe; it will also allow them to more quickly diagnose and repair any damage. Cameras will also help AEP Ohio to coordinate with law enforcement to apprehend

1 thieves and vandals. The cameras can capture images of thieves and will allow
2 AEP Ohio security personnel to relay vital information to law enforcement – for
3 example, whether the thieves are still at the substation or whether (and in what
4 direction) they fled. Lastly, the installed cameras will greatly reduce false alarms.
5 Some cameras will be equipped with technology that will automatically detect
6 whether the alarm has been caused by a human being or something else, such as an
7 animal. Cameras will also allow AEP Ohio security personnel to confirm that the
8 intrusion is due to thieves or vandals, rather than an accident or other false alarm.

- 9 • **Intrusion Sensors** - AEP Ohio also plans to install different types of intrusion
10 sensors, which type will depend on the unique circumstances of each substation.
11 For instance, the Company will install motion sensors that are integrated with
12 cameras. When the sensor detects motion, it will send an alert to AEP Ohio security
13 personnel and automatically bring up the associated camera for the security
14 personnel to review. The Company may also install fence detection cables. These
15 cables run through the chain link fence surrounding the substation. They are under
16 tension, and when the fence is disturbed, they send an alert much like a motion
17 sensor. In certain circumstances, fence detection cables can be more sensitive to
18 intrusions – yet less susceptible to false alarms – than motion sensors. For smaller
19 substations, the Company will install ground radar with associated cameras.
20 Though it has a limited range, ground radar is highly effective at detecting human
21 intrusions and distinguishing between actual threats and false alarms.

- 22 • **Audibles and Lights** - AEP Ohio intends to install “audibles” – essentially, sirens
23 – in conjunction with flashing lights. Loud sirens and flashing lights are highly

effective at deterring would-be thieves and vandals. The Company will only install these deterrent devices in areas where they would be appropriate. For example, the Company will not install lights and sirens in substations located within residential subdivisions.

- **Signs** - When the above technologies are installed, AEP Ohio will install appropriate signage warning that the substations are under constant surveillance. Though they are complementary to the primary intrusion detection and deterrence technologies discussed above, signs nonetheless play an important role in deterring theft and vandalism.

Q11. WOULD THE PROPOSED SECURITY TECHNOLOGY PROTECT ANY OTHER COMPANY ASSETS?

- A. Yes. AEP Ohio crews sometimes park Company trucks within the fence of distribution substations. As a result, installing the proposed security technology would also protect Company trucks from theft and vandalism when they are parked within a substation.

Q12. WHAT ARE THE TIMELINE AND COSTS OF AEP OHIO'S PROPOSED DISTRIBUTION SUBSTATION SECURITY IMPROVEMENTS?

- A. AEP Ohio proposes to install security technology at 137 critical substations over the ESP period, beginning in 2025. The Company's plan is to make physical security upgrades to all of its distribution substations to address the concerns above; however, the 25 substations per year was chosen based on available labor resources and to manage customer bill impacts. Expected capital costs for this deployment are approximately \$65.6 million. The cost estimates for the proposed station upgrades were developed using average data from NERC CIP transmission stations with similar

1 physical security upgrades with the cost then grossed up for inflation. The deployment
2 schedule and estimated costs are shown below in Figure SLS-1:

Figure SLS-1
Estimated Substation Security Deployment Investments (\$000)

	2025	2026	2027	2028	2029	2030	Total
Substations	25	25	25	25	25	12	137
Capital Cost	\$10,925	\$11,362	\$11,817	\$12,289	\$12,781	\$6,380	\$65,555

3 **Q13. WHAT IS AEP OHIO’S PROPOSAL TO RECOVER THE COSTS OF THE**
4 **PROPOSED PHYSICAL SECURITY IMPROVEMENTS?**

5 A. AEP Ohio is requesting that the capital costs of the physical security components be
6 recovered through the DIR.

7 **IV. CONCLUSION**

8 **Q14. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

9 A. Yes, it does.

In accordance with Rule 4901-1-05, Ohio Administrative Code, the PUCO's e-filing system will electronically serve notice of the filing of this document upon the following parties. In addition, I hereby certify that a service copy of the foregoing Ohio Power Company's Direct Testimony of Stephen L. Swick was sent by, or on behalf of, the undersigned counsel to the following parties of record this 6th day of January 2023, via electronic transmission.

/s/ Steven T. Nourse

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Summary: Testimony DIRECT TESTIMONY OF STEPHEN SWICK ON BEHALF
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behalf of Ohio Power Company