COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application Of Kentucky Power Company For A Certificate Of Public Convenience And Necessity To Construct A 138 kV Transmission Line And Associated Facilities In Breathitt, Floyd, And Knott Counties, Kentucky (Garrett Area Improvements 138 kV Transmission Project)	)	Case No. 2021-00346

DIRECT TESTIMONY OF

NICOLAS C. KOEHLER

ON BEHALF OF KENTUCKY POWER COMPANY

DIRECT TESTIMONY OF
NICOLAS C. KOEHLER ON BEHALF OF
KENTUCKY POWER COMPANY
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

CASE NO. 2021-00346

TESTIMONY INDEX

SECTION **PAGE**

DIRECT TESTIMONY OF

NICOLAS C. KOEHLER

ON BEHALF OF KENTUCKY POWER COMPANY
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

CASE NO. 2021-00346

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Nicolas C. Koehler. My position is Director of Transmission Planning for American Electric Power Service Corporation ("AEPSC"). AEPSC supplies engineering, financing, accounting, planning, advisory, and other services to the subsidiaries of the American Electric Power ("AEP") system, one of which is Kentucky Power Company ("the Company"). My business address is 8500 Smiths Mill Road, New Albany, Ohio 43054.

II. BACKGROUND

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I received a Bachelor of Science – Electrical Engineering degree from Ohio Northern University in Ada, Ohio. In 2008, I joined AEP as a Planning Engineer where I advanced through increasing levels of responsibility. I received my Professional Engineer license in the state of Ohio in 2012 (license number 76967). In May 2019, I assumed my current position.

Q. WHAT ARE YOUR RESPONSIBILITIES AS DIRECTOR OF EAST TRANSMISSION PLANNING?

A. My role includes organizing and managing all activities related to assessing the adequacy of AEP's transmission network to meet the needs of its customers in a reliable, cost effective, and environmentally compatible manner. I participate in planning activities with Kentucky Power to address overall system performance.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. Yes. I previously submitted testimony in Case No. 2020-00062.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I am testifying in support of Kentucky Power's application for a Certificate of Public Convenience and Necessity authorizing Kentucky Power to construct the Garrett Area Improvements 138 kV Transmission Project (the "Project"). I will provide information related to the need for the Project.

IV. TRANSMISSION PLANNING AND EXPANSION

Q. HOW DO PJM, AEP, AND KENTUCKY POWER COORDINATE PLANNING AND OPERATION OF KENTUCKY POWER'S TRANSMISSION SYSTEM?

A. Kentucky Power's transmission system is part of the AEP eastern transmission system, which consists of the transmission facilities of ten AEP operating or transmission companies including Kentucky Power, Appalachian Power Company, Ohio Power

Company, Indiana Michigan Power Company, Wheeling Power Company, Kingsport Power Company, AEP Indiana Michigan Transmission Company, AEP Kentucky Transmission Company, AEP Ohio Transmission Company, and AEP West Virginia Transmission Company. This expansive system allows the economical and reliable delivery of electric power for all AEP customers, including customers of Kentucky Power. Planning and operation of the system is integrated through the coordinated efforts of the AEP Transmission Department ("AEP Transmission"), a business unit of AEPSC, and PJM. AEP Transmission works closely with neighboring utilities, other interconnected entities, and PJM to plan and operate the transmission grid. RTOs align the transmission planning and operating requirements set out in each RTO's protocols and operating criteria, as further defined through North American Electric Reliability Corporation (NERC) requirements. Kentucky Power has input into the RTO planning process through AEP Transmission.

Q. PLEASE DESCRIBE THE PJM RTEP PROCESS.

A. The PJM RTEP process is a 24-month planning process that identifies reliability issues over a 15-year horizon. The 24-month planning process consists of overlapping 18-month planning cycles to identify and develop shorter lead-time transmission upgrades and one 24-month planning cycle to provide sufficient time for the identification and development of longer lead-time transmission upgrades that may be required to satisfy planning criteria.

Q. WHAT TYPES OF PROJECTS RESULT FROM THE RTEP PROCESS?

A. Kentucky Power, through AEP Transmission, participates in the PJM planning process, which is guided by PJM, NERC, RFC, and AEP planning criteria. The process generally results in two categories of projects: Baseline and Supplemental. Each category is

described in detail below.

The first project category is Baseline Upgrades. Using the aforementioned criteria, PJM and Kentucky Power, in conjunction with AEP, develop projects to address criteria violations.

Baseline projects include transmission expansions or enhancements that are required to achieve compliance with respect to PJM's system reliability, operational performance, or market efficiency criteria as determined by PJM's Office of the Interconnection, as well as projects that are needed to meet Transmission Owners' local transmission planning criteria.

Q. WHAT IS THE SECOND PROJECT CATEGORY?

A. The second project category is Supplemental Projects. Supplemental Projects include all projects that are not addressing minimum bright-line Transmission Planning criteria. These projects are needed to maintain the existing grid as designed, connect new customers to the grid, satisfy contractual and regulatory requirements, and to meet RTO and industry standards, as set forth in the PJM Operating Agreement. Examples of Supplemental upgrades include interconnection of new retail demand, modification to existing delivery points, replacing failed equipment, proactive replacement of deteriorating assets in poor condition prior to failure, modernization and hardening of the grid, improved operational efficiency and performance, and installation and expansion of supervisory control and data acquisition.

Q. WHAT IS THE PROCESS FOR REVIEWING PJM SUPPLEMENTAL PROJECTS?

A. The process outlines the following steps and requirements:

- provide for separate stakeholder meetings to discuss:

- models, criteria, and assumptions used to plan Supplemental Projects; (Assumptions Meeting);
- needs underlying Supplemental Projects (Needs Meeting); and
- proposed solutions to meet those needs (Solutions Meeting).

- post criteria, assumptions, and models at least 20 calendar days prior to the Assumptions Meeting;
- post criteria violations and drivers at least 10 days in advance of the Needs Meeting;
- post potential solutions and alternatives identified by the PJM Transmission Owners or stakeholders at least 10 days in advance of the Solutions Meeting; and
- submit comments at least 10 days before the Local Plan is integrated into the RTEP for PJM Transmission Owner review and consideration.

FERC has been very specific that the changes it required in Docket EL16-71 are prospective only. Thus, Supplemental Projects reviewed prior to the effective date of the new process were and will continue to be subject to the rules applicable when they were reviewed. It is also important to understand that Supplemental Projects that the Company presents through the PJM stakeholder process are no different from the types of projects for which the Company previously sought, and the Commission previously granted, certificates of public convenience and necessity before Kentucky Power joined PJM. This Project followed the updated requirements for Supplemental projects as outlined above.

Q. DOES KENTUCKY POWER FOLLOW SPECIFIC GUIDELINES TO DETERMINE THE NECESSITY OF SUPPLEMENTAL PROJECTS?

A. Yes. Kentucky Power follows an established and detailed protocol to evaluate and select

Supplemental Projects that assures only projects that are needed are pursued. See **EXHIBIT 21**, AEP's Guidelines For Transmission Owner Identified Needs.

The guidelines discuss the drivers or inputs that should be considered when evaluating transmission system needs. The guidelines ensure that all AEP-affiliated Transmission Owners are applying consistent criteria in their evaluations; Kentucky Power ultimately determines the mix of Supplemental Projects needed to maintain the reliability of its transmission grid within the AEP Zone.

Consistent with the AEP Guidelines for Transmission Owner Identified Needs, Kentucky Power considers safety risks or concerns, asset condition, abnormal operating conditions, reliability performance, RTO or ISO notices, stakeholder and customer input, state and federal standards or policies, including NERC transmission planning standards, and environmental impacts in identifying Supplemental Projects.

Q. WHAT DRIVERS OR INPUTS DOES KENTUCKY POWER CONSIDER IN IDENTIFYING SUPPLEMENTAL PROJECTS?

A. Consistent with the AEP Guidelines for Transmission Owner Identified Needs, the considerations include:

Equipment Condition, Performance and Risk: These are investments made to ensure the safe and reliable operation of the transmission system. The decision to pursue such projects can be based on equipment performance, obsolescence and expected life concerns, equipment condition, reliability impact, maintenance costs, environmental impact and engineering recommendations.

Operational Flexibility and Efficiency: These projects can optimize system configuration, lower equipment duty cycles, reduce the impact on and limit the

exposure to customers for planned or forced outages and can facilitate improved restoration times. They also provide opportunities to bring the system up to current standards and design principles.

Infrastructure Resilience: These projects can improve system ability to anticipate, absorb, adapt to and/or rapidly recover from disruptive natural or man-made events including severe weather, geo-magnetic disturbances and physical and cyber security challenges.

Customer Service: These projects accommodate new, increasing or future load so that the system can reliably address customer needs.

Other Drivers: Examples include industry recommendations, changes to standards and regulations, and state policy objectives.

Q. WHAT IS PJM'S ROLE IN REVIEWING SUPPLEMENTAL PROJECTS?

A. All projects affecting the topology of the grid (i.e., projects that impact the modeled structure of the grid), whether baseline or supplemental, are subject to the stakeholder process within PJM. While PJM does not "approve" Supplemental Projects, these projects are submitted to PJM and reviewed with the TEAC or Sub-regional RTEP Committee – Western on a regular basis (typically monthly). All TEAC and Sub-regional RTEP Committee – Western meetings are open and any transmission stakeholder can attend and participate. Any stakeholder input regarding specific projects is vetted through this PJM committee meeting process. Supplemental Projects are subject to two rounds of review and detailed system needs and project information, including alternative solutions, are provided to stakeholders.

Q. IS THE DESIGNATION OF A PROJECT AS A BASELINE OR SUPPLEMENTAL PROJECT INDICATIVE OF WHETHER THE PROJECT IS NECESSARY, OR

HOW NECESSARY IT IS?

A. No, it is not. The designation of a project as a Baseline or Supplemental Project is not indicative of the level of, or absence of, need for the project. Instead, the designations simply reflect that the project satisfies different planning requirements and parameters. The criteria for designation as a Supplemental or Baseline project are not mutually exclusive, and a single project sometimes can be justified under either.

Supplemental Projects are required for the reasons discussed in Section VIII of this testimony. Supplemental Projects improve or preserve a PJM Transmission Owner's ability to provide reliable service to its customers, consistent with its obligation to serve, and are grounded in good utility practice.

Q. DOES PJM FACTOR THE AGE OR CONDITION OF EQUIPMENT INTO ITS FORWARD LOOKING MODELS FOR SYSTEM RELIABILITY?

A. No, it does not. The forward-looking models that PJM and transmission owners employ to identify Baseline Projects assume the modeled system will perform as designed without regard to the age or actual condition of all the elements of the transmission system, including those elements constructed, upgraded, or maintained as non-baseline elements. This means that for modeling purposes, a substation with 75-year old components that are deteriorating is assumed to function with the same reliability as a five year old substation with newer components.

Although PJM transmission planning treats load dropping as an acceptable means of mitigating potential system reliability criteria violations under certain scenarios, such a planning approach is contrary to Kentucky Power's obligation under KRS 278.030(3) to provide "adequate, efficient and reasonable service," including the safe and reliable

delivery of electricity to its customers. In that regard, Baseline projects alone would be insufficient to satisfy Kentucky Power's obligation to provide safe and reliable service to its customers.

Q. IS ALL OF THE WORK ASSOCIATED WITH A TRANSMISSION PROJECT SUBMITTED TO PJM?

A. No. There are project elements that either do not change the transmission grid's topology, or that are implicit in the description of larger projects, that are not required to be submitted to PJM for explicit review. These project elements do not affect the transmission grid analysis within the framework of PJM's FERC-approved planning process. These project elements nevertheless are essential to the larger projects submitted to PJM.

For example, when a new breaker installation project is submitted to PJM, the breaker would likely be the only major piece of equipment listed in the submission. The PJM submission would not include a listing of elements such as Coupling Capacitor Voltage Transformers (CCVTs) and relaying required for the breaker to function properly. CCVTs are utilized for real time voltage sensing on the grid. Relays receive information from CCVTs and other instrument transformers and determine the proper course of action for the equipment to which they are tied. Without the relays and CCVTs, the breaker would not know when or how to operate.

Q. IS THERE ALSO A PROCESS FOR REVIEWING TRANSMISSION PROJECTS AT FERC?

A. Yes. In addition to the PJM stakeholder review, there is another opportunity to evaluate the prudence of transmission projects at FERC. Specifically, AEP's annual transmission formula rate filings include protocols for the review of both the annual projection and true

up of the AEP formula rates.

V. PROJECT NEED.

Q. PLEASE DESCRIBE THE NEED DRIVING THE PROJECT.

A. This project is driven by Equipment Material/Condition/Performance/Risk, Customer Service, and Operational Flexibility and Efficiency needs in the 46 kV network and the 138 kV network in the area of the Garrett, Hueysville, Lackey, and Wayland communities. The 25 mile long Beaver Creek – McKinney 46 kV #1 circuit serves Eastern Kentucky Power Cooperative's (EKPC) Salt Lick substation and Kentucky Power's (KPCO) Spring Fork and Garrett substations that serve Kentucky Power company Distribution Customers. The circuit is comprised of 152 structures, the majority of which are wood structures dating back to 1929 (22/152, 14%) and 1949 (61/152, 40%). Inspections of the circuit indicate 142 open conditions have been observed (existing and unaddressed physical conditions associated with a Transmission Line component) along the line. These include damaged poles and cross-arms, conductor/shield wires, and guy anchor/knee/vee braces. In the last five years, there have been 36 momentary and 6 permanent outages on the Beaver Creek – McKinney 46 kV #1 Circuit. The momentary outages were due to lightning (25), wind (6), other weather (1), distribution (1), line insulator (1), other (1) and unknown (1) causes. The permanent outages were due to vegetation fall-in from outside of the ROW (2) and lightning (2). The 6 permanent outages caused approximately 337 thousand minutes of interruption for the customers served out of Beaver Creek – Mckinney 46kV #1 circuit.

Hays Branch 138 kV substation serves approximately 32 MW of load at MarkWest Hydrocarbon's gas compressing operation via an approximately 8.25 mile-long radial line

out of Morgan Fork station. This meets the AEP threshold of 75 MW/mile that is used to consider looping load instead of continued service on a radial feed. Radial feeds require outages to customers served from the radial for any maintenance activities or unplanned outages associated with the equipment or the line serving the customer.

Q. HAS THE PROJECT GONE THROUGH THE PJM M-3 PROCESS?

Yes. The project was posted to the local plan on April 10, 2020 and subsequently assigned Supplemental ID s2188.1 through s2188.11 and reviewed with stakeholders at the June 17, 2019 and February 21, 2020 Sub-Regional RTEP-Western meetings hosted by PJM. The local plan slides were updated on November 4, 2021 to clarify the scope associated with Eastern and Garrett substations and to update the total line mileage to be constructed after the siting process was completed. The project costs in the local plan slides reflect transmission cost estimates and do not reflect distribution substation cost estimates. Any further updates to the local plan slides, including cost estimates, anticipated to occur during this proceeding will be submitted accordingly.

Q. PLEASE DESCRIBE HOW THE PROJECT ADDRESSES THE NEEDS YOU IDENTIFY ABOVE.

A. Overall, this work would eliminate the need to rebuild the approximately 25 miles of Beaver Creek – McKinney #1 circuit and allow retirement of this 46 kV circuit. In order to do so, this Project proposes to construct approximately 15 miles of 138 kV line to provide 138 kV service to the customers in the area, construct 2 substations and one new switch structure (SS) to connect to the proposed 138 kV lines. The two substations will include converting the existing Garrett 46 kV substation to 138 kV and a new greenfield

substation called Eastern. The proposed 138 kV work would provide looped service to the radially fed customers in the area.

Q. HOW MANY CUSTOMERS ARE SERVED BY THIS TRANSMISSION LINE IN THE AREA?

A. The existing transmission grid in the Project area serves loads at the Hays Branch, Garrett and Spring Fork substations as well as the Salt Lick delivery point to EKPC.

- The Garrett substation currently serves roughly 6 MVA of load. This load includes total of 1,355 customers which serves residential and small commercial, serves communities of Garrett, Hueysville, Lackey, Wayland.
- Spring Fork substation serves 0.3 MVA of load which has about 20 residential customers and serves a small area along Mine Shaft Road.
- Salt Lick delivery point provides service to EKPC's Big Sandy Rural Electric Cooperative (RECC) which serves about 4.75 MVA of load.
- Hays Branch 138 kV substation serves approximately 32 MW MarkWest Hydrocarbon's gas compressing operation.

Q. WILL DISTRIBUTION LINE WORK BE UNDERTAKEN AT THE TIME OF THE TRANSMISSION PROJECT?

A. Yes. Kentucky Power will extend its existing distribution system in the usual course of business to serve Spring Fork customers. Distribution system improvements for functional estimates of approximately $2.4M associated with the Project would also bring benefits to Kentucky Power customers. Notably, new distribution equipment is generally to be located closer to roadways, which should enable improved access and cleared rights of way. In addition, along the line route, there is increased load serving capability to serve new

residential, commercial, and small industrial loads in the future. The Company anticipates that updated distribution cost estimates will be available in the coming months during this proceeding.

Q. ARE THERE ADDITIONAL BENEFITS THAT THE PROJECT WILL PROVIDE?

A. Yes. The project not only addresses Kentucky Power's identified needs on the Beaver Creek – McKinney #1 circuit, it also improves the service to customers in the area by providing looped service to radially fed customers and retires approximately 25 miles of 46 kV line.

VI. PROJECT DESCRIPTION.

Q. PLEASE PROVIDE AN OVERVIEW OF THE PROPOSED PROJECT.

A. The Project consists of 12 components to address the needs discussed above. The description below has been updated to reflect the most current descriptions of the proposed project from the November 4, 2021 local plan update. In the event additional updates are made to the proposed Project during this proceeding the Company will update this filing accordingly:

(1) Construction of approximately 10.3 miles of single circuit 138 kV line from Soft Shell to Garrett picking up Salt Lick Co-op via Snag Fork in FLOYD and KNOTT counties, Kentucky (the "Garrett Area Improvements 138 kV Transmission Project");

(2) The construction of approximately 3 miles of single circuit 138 kV from the Eastern station to Garrett station. Construct a short extension to existing Morgan Fork – Hays Branch 138 kV circuit from Eastern station.

(3) The construction of double circuit cut into existing Hays Branch - Morgan Fork line to tie into new Eastern station.

(4) The construction of approximately 1.4 miles of double circuit 138kV line between Eastern and the tap point on the Morgan Fork – Hays Branch line. The proposed line will establish a direct feed to Hays Branch from Eastern and establishing a through path line between Eastern and Morgan Fork.

(5) Relay modification at the Hays Branch substation to allow the tie to Eastern substation.

(6) Expansion of the Garrett station to convert to 138 kV service by installing two 138 kV breakers on the line exits, a 138/12kV 30 MVA transformer, and a 138 kV circuit switcher.

(7) The construction of a new 138 kV substation (called Eastern) south of the existing Hays Branch station. Install three 138kV breakers (3000A 40kA) at the new Eastern station in a ring bus arrangement. Due to the site limitations this station will be a modified vertical ring bus utilizing three 138kv box bays with the ring being closed by extending the bus over all three bays on post insulators. Install a new drop-in control module (DICM) 16’ x 27’ to contain the new relaying.

(8) the construction of Snag Fork Switch Station. Install a 3 way phase over phase motorized (automated) switching structure near Salt Lick to serve the EKPC co-op.

(9) Move and reuse the existing 69 kV rated CB G to the Beaver Creek – McKinney #2 circuit exit at McKinney substation.

(10) Install a 138 kV breaker (3000A 40kA) to accommodate a new line exit towards Garrett station (via Snag Fork) at Softshell substation.

(11) the retirement of approximately 25 miles of the 46 kV Beaver Creek – McKinney #1 46 kV circuit and Retire Spring Fork Tap.

(12) Distribution line work to accommodate retirement of Spring Fork substation and relocate this load to Haddix substation.

See **EXHIBIT 14** to the Application (Present System and Project Components).

Company Witness Reese describes the process used to identify the Garrett Area Improvements 138 kV Transmission Project right-of-way.

Q. IS THERE AN EXHIBIT IN THIS FILING THAT PROVIDES ADDITIONAL DETAILS ON THE PROJECT COMPONENTS?

A. Yes. Exhibit 16 to the Application identifies the major Project components, their purpose, and the principal drivers for their inclusion in the project.

Q. WHAT DOES KENTUCKY POWER PROPOSE TO INSTALL AT THE GARRETT 138 KV SUBSTATION?

A. The existing Garrett 46 kV substation will be converted to 138 kV. The newly expanded Garrett 138 kV substation will consist of 2-138 kV Breakers, a 138/12 kV 30 MVA transformer, 12 kV transformer bank breakers, 12 kV bus regulators, and a new 16’ x 27’ (DICM). The existing 12 kV breakers will be reused in the new arrangement at Garrett.

The proposed layout drawing and location map for the Garrett 138 kV Substation is included as **EXHIBIT 6** to the Application.

Q. WHAT DOES KENTUCKY POWER PROPOSE TO INSTALL AT THE EASTERN 138 KV SUBSTATION?

A. A new greenfield 138 kV Eastern substation will be established. This Eastern 138 kV Substation will consist of a new 138 kV ring bus station with three line exits, three 138 kV circuit breakers, and a 16' x 27' DICM.

The proposed layout drawing and location map for the Eastern 138 kV Substation is included as **EXHIBIT 5** to the Application.

Q. PLEASE EXPLAIN WHY KENTUCKY POWER IS PROPOSING TO RETIRE THE EXISTING BEAVER CREEK – MCKINNEY #1 46 KV TRANSMISSION LINE?

A. This retirement is important for several reasons:

First, the 46 kV system is obsolete. Finding the equipment in the event of failures and maintenance is challenging. The circuit has high exposure risk to the area customer load and is consisting of damaged poles and cross arms, old conductor and poor lightning protection and conditions related to guy/anchor/knee/vee braces. Furthermore, the 46 kV system is subject to a more frequent inspection cycles[1] compared to 138 kV system and thus increases the overall O&M costs.

Second, Salt Lick and Spring Fork substations are fed radially with no other 46 kV source in the area. Any maintenance or forced outage leaves these customers without transmission service.

Third, the condition and the performance of the existing Beaver Creek – McKinney #1 circuit, discussed above, impedes the Company's ability to provide reliable service to customers.

By completing the proposed Project and moving the existing load to the 138 kV network, the deteriorated 46 kV lines can be retired and removed while providing looped service to the customers who have experienced large amounts of CMI as described above.

Q. WHY NOT REBUILD THE EXISTING 46 KV CIRCUIT?

[1] https://apps.legislature.ky.gov/law/kar/807/005/006.pdf

A. Rebuilding the existing 46 kV circuit as it exists today does not completely address the area needs. After rebuilding the existing 46 kV circuit, the Company would still need to loop the Hays Branch 138 kV substation, the Spring Fork 46 kV substation, and the Salt Lick 46 kV delivery point which are currently served at 46 kV. Removing the load from 46 kV network and moving it to the 138 kV system addresses the needs identified on the 46 kV network. This also allows the opportunity to loop the existing radial 46 kV and 138 kV loads in the area via the proposed 138 kV connections.

Additionally, Proposed work would co-ordinate with and connect to two previously approved projects: (i.) Soft Shell 138 kV Transmission Line (Case No. 2007-00430) and (ii.) Hays Branch-Morgan Fork 138 kV Transmission Line (Case No. 2007-00155) which established new delivery points in the area at 138 kV. Connecting these two projects with the new 138 kV line as proposed in the Project allows for the retirement of 25 miles of deteriorating 46 kV line.

Q. DOES KENTUCKY POWER PLAN TO PERFORM ANY OTHER WORK IN CONNECTION WITH THIS PROJECT?

A. Kentucky Power plans to complete associated remote end relaying work at Morgan Fork substation which would allow the relays to communicate with the remote end at Eastern substation. This routine remote end work is being undertaken in the normal course of operating and maintaining the Company's transmission facilities. This work will be performed in conjunction with the installation of new 138 kV breakers and relaying at the proposed Eastern substation.

At Beaver Creek substation, Kentucky Power will remove 46 kV circuit breaker A along with associated equipment to allow retirement of Beaver Creek – McKinney 46 kV #1 circuit.

EXHIBIT 9 illustrates the layout of the work to be performed and the location of Beaver Creek substation.

Q. COULD THE SERVICE TO BE FURNISHED BY THE PROJECT BE REASONABLY PROVIDED BY REBUILDING AN EXISTING TRANSMISSION LINE OR EXTENDING SERVICE FROM AN EXISTING SUBSTATION?

A. No. Although generally the Company prefers to rebuild or upgrade an existing transmission line when practicable, in this instance rebuilding existing 46 kV transmission lines would still leave customers served radially out of Spring Fork substation and Salt Lick delivery point. Additionally, rebuilding existing lines would warrant other 138 kV transmission line work to loop the 32 MW load served from Hays Branch that meets the 75 MW/mile guidelines.

VII. ALTERNATIVES TO THE PROJECT.

Q. WHAT ELECTRICAL ALTERNATIVES WERE EVALUATED BY THE COMPANY?

A. Kentucky Power considered an alternative that would require Kentucky Power to rebuild the Beaver Creek – McKinney 46 kV #1 circuit, approximately 25 miles, and keep the system configuration as is. In order to provide comparable benefits of the project, the Company also would be required to construct approximately 6.5 miles of 138 kV line from Stanville station, and rebuild approximately 3.5 miles of 138 kV existing single circuit to

double circuit 138 kV line in order to provide the looped service to the load served out of Hays Branch substation.

While this solution would resolve the currently identified needs on the Beaver Creek – McKinney #1 circuit, it would require Kentucky Power to maintain and operate an obsolete 46 kV system, and leave customers served radially out of Spring Fork substation and Salt Lick delivery point.

Q. IS THE ALTERNATIVE LESS EXPENSIVE THAN THE COMPANY'S PROPOSAL?

A. No. The total estimated transmission cost of the alternative was $105 million, which was approximately 28 percent greater than the $81.9 million transmission cost estimate presented at the time of the Solution meeting. See **EXHIBIT 23** for additional details. When comparing the current total estimated cost of the project, which includes both transmission and distribution investments as presented in Witness West's testimony, the alternative is approximately 20 percent more expensive. Because of the costs, and other disadvantages as further described below, this alternative was not considered to be a reasonable alternative to the Project.

Q. WHAT ARE THE ADDITIONAL DISADVANTAGES TO THE ALTERNATIVE CONSIDERED BY KENTUCKY POWER?

A. Reliability for the customers served out of Spring Fork substation and Salt Lick delivery point would be unchanged; any extended outage on the 46 kV system would still keep them de-energized for long period of time without an alternate source. In addition, the Company would need to maintain 46 kV system at 46 kV operating voltage even though it would be build and designed to 69 kV standards. This alternative would propose to construct 6.5

miles of single circuit 138kV, 3.5 miles of new double circuit 138kV and rebuild 25 miles of 46kV lines in the area. This would further increase O&M for the company.

Given all of these disadvantages, and an estimated cost of $105 million, this alternative was not chosen.

VIII. PJM REVIEW.

Q. IS THE PROJECT DESIGNATED AS SUPPLEMENTAL BY PJM?

A. Yes. It is a Supplemental Project. PJM has assigned the Project the designation of s2188.

Q. PLEASE PROVIDE A SUMMARY OF THE PROJECT'S ADVANCEMENT THROUGH THE PJM PROCESS?

A. The Project was first submitted at the Subregional Reliability Transmission Expansion Plan Committee meeting held on June 17, 2019. The slide was presented again at the RTEP meeting on February 21, 2020 and is provided as Exhibit 23. The project was originally posted to the local plan on April 10, 2020 and a revised version was updated on November 4, 2021 and is provided as **EXHIBIT 22**.

The anticipated in-service date for the Project is November 2024.

Q. CAN TEMPORARY MEASURES BE TAKEN TO REPAIR OR IMPROVE THE EXISTING STRUCTURES?

A. No, this project is driven by asset renewal concerns, making logical upgrades, and connecting two existing previously approved 138 kV projects, which will result in a stronger regional electrical grid.

Q. PLEASE EXPLAIN.

A. Temporary repairs on old structures are just that and only so many “fixes” can be effectively and safely completed on aging structures. It becomes unreasonable to maintain a failing asset as compared to replacing and bringing the current system up-to-date. The company has the statutory obligation to maintain its equipment and provide reliable service.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

docVerify

Koehler Garrett CPCN Verification_11-5.docx

DocVerify ID:	A341B096-0F30-4A13-83F5-4BE4F978FEC5
Created:	November 05, 2021 05:23:08 -8:00
Pages:	1
Remote Notary:	Yes / State: OH

This document is a DocVerify VeriVaulted protected version of the document named above. It was created by a notary or on the behalf of a notary, and it is also a DocVerify E-Sign document, which means this document was created for the purposes of Electronic Signatures and/or Electronic Notary. Tampered or altered documents can be easily verified and validated with the DocVerify veriCheck system. This remote online notarization involved the use of communication technology.

Go to www.docverify.com at any time to verify or validate the authenticity and integrity of this or any other DocVerify VeriVaulted document.

E-Signature Summary

E-Signature 1: Nicolas C Koehler (NCK)
November 05, 2021 05:39:24 -8:00 [271317D3BDC2] [167.239.221.104]
nckoehler@aep.com (Principal) (Personally Known)

E-Signature Notary: S. Smithhisler (SRS)
November 05, 2021 05:39:24 -8:00 [7129C6E1F5DF] [161.235.221.105]
srsmithhisler@aep.com
I, S. Smithhisler, did witness the participants named above electronically sign this document.

VERIFICATION

The undersigned, Nicolas C. Koehler, being duly sworn, deposes and says he is the Director of Transmission Planning for American Electric Power Service Corporation, that he has personal knowledge of the matters set forth in the forgoing testimony, and the information contained therein is true and correct to the best of his information, knowledge and belief after reasonable inquiry.

Nicolas C Koehler

_____

Nicolas C. Koehler

STATE OF OHIO)

) Case No. 2021-00346

COUNTY OF FRANKLIN)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Nicolas C. Koehler, on 11/05/2021.

S Smithhisler

_____

Notary Public

Notarial act performed by audio-visual communication

Notary ID Number: 2019-RE-775042