COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

ELECTRONIC JOINT APPLICATION OF AMERICAN ELECTRIC POWER COMPANY, INC., KENTUCKY POWER COMPANY AND LIBERTY UTILITIES CO. FOR APPROVAL OF THE TRANSFER OF OWNERSHIP AND CONTROL OF KENTUCKY POWER COMPANY	**)**	**CASE NO. 2021-00481**

REBUTTAL TESTIMONY

AND EXHIBITS

OF

STEVEN R. HERLING

ON BEHALF OF

LIBERTY UTILITIES CO.

CHARLES RIVER ASSOCIATES
BOSTON, MASSACHUSETTS

March 2022

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

ELECTRONIC JOINT APPLICATION OF AMERICAN ELECTRIC POWER COMPANY, INC., KENTUCKY POWER COMPANY AND LIBERTY UTILITIES CO. FOR APPROVAL OF THE TRANSFER OF OWNERSHIP AND CONTROL OF KENTUCKY POWER COMPANY	**)**	**CASE NO. 2021-00481**

TABLE OF CONTENTS

I. INTRODUCTION AND SUMMARY

Q. Please state your name and business address.

A. My name is Steven R. Herling. My business address is 200 Clarendon St., Boston, Massachusetts, 02116.

Q. Please describe your professional background.

A. I am currently a Senior Consultant with Charles River Associates, providing consulting services related to planning, operational, and regulatory issues facing the electric power industry. I retired from PJM Interconnection, LLC in July 2020 where I had been employed since May 1990. At PJM, I held a number of positions in the Operations and Planning Divisions and was promoted to Vice President of Planning in May 2004. While at PJM, I contributed to or led initiatives that resulted in a wide range of milestone achievements in its evolution and growth as a regional transmission organization ("RTO"), including the creation of the RTEP process, the development of procedures and standard terms and conditions for generation and merchant transmission interconnections, the development of the competitive transmission process, and the reliability and adequacy aspects of successive integrations of additional control areas that more than doubled the size of the PJM market area. In addition to my work for PJM, I contributed to a wide range of activities for the North American Electric Reliability Corporation ("NERC") and on various regional industry working groups and committees addressing reliability and planning matters.

Prior to joining PJM, I worked for the General Public Utilities Service Corporation ("GPU") for three years in systems operations, where I was responsible for dispatcher training and certification, operations, planning activities, and energy management system and operational support tools. Prior to GPU, I worked for the American Electric Power Service Corporation ("AEP") for eight years in bulk transmission planning. In that position, I performed a range of power system analyses related to the AEP 765 kV transmission system, generator and circuit breaker dynamic modeling and the mechanical behavior of turbine-generator shaft systems.

Q. Please describe your educational and professional credentials.

A. I hold a Bachelor of Science in Electric Power Engineering and a Master of Engineering in Electric Power Engineering, both from Rensselaer Polytechnic Institute. Please refer to my resume attached as Exhibit SRH-1.

Q. Have your previously provided testimony?

A. Yes. I have testified in transmission line Certificate of Public Convenience and Necessity ("CPCN") proceedings in Pennsylvania, West Virginia, Virginia, and New Jersey. I have also testified on a number of occasions on system planning and reliability issues in proceedings before the Federal Energy Regulatory Commission ("FERC"), various state commissions, and legislative task forces.

Q. Please describe the purpose of your Rebuttal Testimony?

A. My testimony will address suggestions made by Stephen J. Baron in his direct testimony on behalf of the Office of the Attorney General of the Commonwealth of Kentucky and Kentucky Industrial Utility Customers, Inc. Specifically, Mr. Baron suggests that AEP obtain an amendment to the PJM Tariff to permit Kentucky Power Company ("KPCo") to form its own transmission zone. My testimony will discuss the process that would be required to allow such a zone to be created and the uncertainties that KPCo would face if they pursued such a course of action.

II. STAND-ALONE TRANSMISSION ZONE

Q. Could KPCo form its own transmission zone within PJM?

A. No. The existing PJM transmission zones are identified in Attachment J to the PJM Tariff. The restrictions related to the formation of new transmission zones are stated in Section 7.4 of the Consolidated Transmission Owners Agreement (CTOA). Section 7.4 of the CTOA states as follows:

> For purposes of developing rates for service under the PJM Tariff, transmission rate Zones smaller than those shown in Attachment J to the PJM Tariff, or subzones of those Zones, shall not be permitted within the current boundaries of the PJM Region; provided, however, that additional Zones may be established if the current boundaries of the PJM Region is expanded to accommodate new Parties to this Agreement.

Because KPCo is part of the AEP transmission zone, under the existing rules set forth in the CTOA, a new KPCo transmission zone cannot be created within PJM, separate from the AEP transmission zone.

Q. What would be required for KPCo to form its own transmission zone within PJM?

A. For KPCo to form its own transmission zone within PJM, the CTOA would have to be amended through a filing with the Federal Energy Regulatory Commission (FERC). Amendments to the CTOA must be approved by the CTOA Administrative Committee, requiring concurrence of two-thirds of the individual transmission owners as well as two-thirds of the transmission owners on a weighted basis, where the weighted votes are proportional to the net book value of each party's transmission facilities. If approved by the CTOA Administrative Committee, amendments are then filed with the FERC.

If an amendment to the CTOA was approved by FERC to allow for the formation of new transmission zones within PJM, such as by KPCo, implementation procedures would need to be developed through the PJM stakeholder process related to planning, operations, and market impacts of such a change. Additionally, rules would need to be developed defining the allowable size and configuration of new transmission zones.

Q. Please describe the nature of the rules and procedures required to implement such a change to the CTOA?

A. The PJM transmission zones, identified in Attachment J of the PJM Tariff, are an integral part of the PJM planning process and are very closely linked to the capacity market structure. At the most basic level, the definition of a new transmission zone would require a range of activities related to modeling in planning, markets, and operations. Because of the linkages between transmission planning and resource adequacy planning, load within a zone relies on the generation resources within that zone and the ability of the transmission system to deliver external resources to that zone.

If new zones were created that did not have sufficient internal generation or had electrically separated load areas, the deliverability construct of the PJM planning process could identify violations of NERC reliability standards and require reinforcement of the transmission system. Rules and procedures would have to be considered that would impose boundaries on the creation of new zones or identified how such zones would be managed in the planning process.

The PJM transmission zones are also integral to the functions of the capacity market construct. Market rules and procedures determine how capacity prices are established and when prices differ between zones if a zone has insufficient internal capacity and limited transmission transfer capability across its borders. These rules and procedures also determine, as discussed further by witness Plewes, whether a zone can avail itself of the Fixed Resource Requirement (FRR) construct. Again, if new zones were created that did not have sufficient internal generation or had electrically separated load areas, the capacity market construct could impose restrictions on the load within that zone regarding satisfaction of its capacity obligations and could require the development of new rules or procedures.

Q. Could any party make such a filing, unilaterally, to amend the CTOA?

A. The Administrative Committee of the CTOA is empowered to make a 205 filing with the FERC to amend the CTOA, based on the approval requirements discussed above. Failing to secure the necessary two-thirds concurrence of the parties to the CTOA, an individual transmission owner, such as KPCo, would need to request such an

amendment through a 206 filing with the FERC. The timing for consideration of a 206 filing by the FERC is much less certain than that for a 205 filing, and the likelihood of success should be expected to be lower because the filing party would have to demonstrate that the CTOA was unjust and unreasonable, a much higher burden of proof than that for a 205 filing.

Q. Would AEP or any other party be better positioned than KPCo to seek a change to the CTOA through a 206 filing with the FERC?

A. No. KPCo is the party most impacted by the CTOA restriction and the best party to seek a change from the FERC. However, as discussed above, they would need to demonstrate that the provisions of the CTOA were unjust and unreasonable, a significant hurdle.

Q. If KPCo were allowed to form a new zone within PJM, what uncertainties would that zone face?

A. Significant uncertainties would exist based on the evaluation of such a new zone within the PJM planning process. A KPCo zone would be the smallest of the utility load serving zones in PJM. The KPCo peak load is approximately 1200 MW with the next smallest of the utility load serving zones being EKPC at approximately 2400 MW. A KPCo zone would have very little electrically internal generation, resulting in a significant load/generation imbalance, while the EKPC has more than half of its load served by internal generation. Within the planning process, the load deliverability construct will evaluate the robustness of the KPCo transmission system differently as a separate zone

compared to its current status as part of the AEP zone. This is a function of the linkage to the resource adequacy construct, ensuring that KPCo load can be served, consistent with reliability criteria, relying on a balance of internal and external generation and ties to the rest of the PJM system. The planning process determines Capacity Emergency Transfer Objectives (CETO) for all zones to identify the amount of transmission import capability required, under contingency conditions, to ensure that reliable service to customer load. For a KPCo zone, that CETO could actually exceed the peak load of the zone and increase in the event of future generation retirements. The load deliverability construct could identify violations of criteria that require upgrades to the transmission system. As the load/generation balance within the zone changes over time, the load deliverability construct will re-evaluate the robustness of the grid serving the KPCo load.

Q. Mr. Baron points out that a stand-alone KPCo zone would have a larger revenue requirement than four of the current twenty PJM transmission zones. Is this relevant to the feasibility of creating a stand-alone KPCo transmission zone?

A. No. The uncertainties that I discuss above are related to the load/generation balance that would exist in a KPCo transmission zone.

Q. How would the uncertainties in the planning process carry over to KPCo's obligations related to installed capacity?

A. With respect to capacity obligation costs, KPCo's initial ability to avail itself of the FRR construct is subject to a significant degree of uncertainty, as discussed above. It's on-going

ability to avail itself of the FRR construct will depend on the generation/load balance within the KPCo zone and the type of generation within the zone. The capacity value of renewable generation, for example, is less than that of fossil generation due to intermittency. With respect to PJM's RPM auctions, capacity prices in KPCo, as a separate zone, could be higher than prices in western PJM due to the generation/load balance within KPCo and the robustness of the transmission feeding the KPCo load. This is a direct consequence of the load deliverability discussion, above. Because of the low level of internal generation, a KPCo zone would have a relatively high CETO, requiring a proportionately high contingency import capability. Price separation can occur regardless of whether violations of transmission standards are identified in the planning process. Should a KPCo zone be ineligible to utilize the FRR construct and RPM auction prices separately, the result would be higher capacity costs within the KPCo zone. These potentially significant costs would represent incremental investments that would not otherwise be required but for the standalone zone approach advocated by Mr. Baron.

Q. Does Mr. Baron acknowledge this possibility and account for its financial implications in his calculation of the $75 million retain credit he proposes?

A. No, he does not.

Q. What other uncertainties would a KPCo zone face?

A. With respect to transmission rates, the rates paid by KPCo customers will be based on KPCo-driven transmission upgrades, or Supplemental Projects, combined with an

allocation of costs related to PJM-directed transmission upgrades. Supplemental Projects are transmission projects identified by a transmission owner that are related to drivers other than those specified in the PJM planning process, such as replacement of aging infrastructure. Today, KPCo pays for a share of Supplemental Projects identified by AEP. As a separate zone, KPCo would pay the full cost of Supplemental Projects identified by KPCo. Today, KPCo pays for a share of the cost for PJM-directed projects that is allocated to AEP. As a separate zone, KPCo would receive a direct allocation for the same projects. Based on the electrical and geographical distribution of KPCo load compared to AEP load, that allocation will be different. It is difficult to estimate that difference since every transmission project is unique and has a unique cost allocation. The KPCo cost share of future Supplemental Projects will be based on the balance of the need for such upgrades within KPCo as compared to within AEP as a whole. The KPCo cost share of future PJM-directed projects could be higher or lower for individual projects.

III. RECOMMENDATIONS

Q. What is your recommendation with regard to next steps for KPCo?

A. Based on the uncertainties that I have discussed, I recommend that any decision to attempt to separate KPCo from the AEP transmission zone be deferred until further evaluation can be performed as to both potential administrative and technical feasibility and impacts on Kentucky ratepayers. It is entirely possible that a KPCo transmission

zone, due to limited internal generation, would not be eligible to utilize the FRR construct to satisfy its installed capacity obligations and that RPM auction capacity prices in KPCo would be higher than in the AEP zone. Should KPCo be prematurely separated from the AEP transmission zone, these impacts could be difficult to reverse. Future trends in transmission investment and the consequent impacts on rates should also be carefully assessed before any decision is made to attempt to separate KPCo from the AEP transmission zone. I believe that Liberty's proposal to study the merits of staying in PJM over the first two years of its ownership constitutes such a study.

Q. Does this conclude your testimony?

A. Yes.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

ELECTRONIC JOINT APPLICATION OF AMERICAN ELECTRIC POWER COMPANY, INC., KENTUCKY POWER COMPANY AND LIBERTY UTILITIES CO. FOR APPROVAL OF THE TRANSFER OF OWNERSHIP AND CONTROL OF KENTUCKY POWER COMPANY	**)**	**CASE NO. 2021-00481**

EXHIBITS

OF

STEVEN R. HERLING

ON BEHALF OF

LIBERTY UTILITIES CO.

CHARLES RIVER ASSOCIATES
BOSTON, MASSACHUSETTS

March 2022

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF:

ELECTRONIC JOINT APPLICATION OF AMERICAN ELECTRIC POWER COMPANY, INC., KENTUCKY POWER COMPANY AND LIBERTY UTILITIES CO. FOR APPROVAL OF THE TRANSFER OF OWNERSHIP AND CONTROL OF KENTUCKY POWER COMPANY	**)**	**CASE NO. 2021-00481**

EXHIBIT_(SRH-1)

OF

STEVEN R. HERLING

Professional Qualifications

Of

Steven R. Herling

ME, Electric Power Engineering
Rensselaer Polytechnic Institute, (1979)

BS, Electric Power Engineering
Rensselaer Polytechnic Institute, (1978)

Licensed Professional Engineer - Ohio

Charles River Associates (2021 – Present)

Senior Consultant

- Provide expertise to support strategic decision making related to planning, operational, and regulatory issues facing the electric power industry.

Herling Power Grid Consulting, Inc. (2020 – Present)

President

- Provide expertise to support strategic decision making related to the development of planning processes and the integration with electric power grid market structures.
- Provide expertise to support strategic decision making related to the integration of renewable technologies onto the electric power grid.
- Provide expert witness services in transmission line siting proceedings.

Yoh Staffing Services (2020 – 2021)

Executive Consultant

- Provide expert witness services in transmission line siting proceedings.

PJM Interconnection, LLC (1990 – 2020)

Executive Consultant, Planning (2019 – 2020)

- Provide expert witness services in support of the Transource 500/230 kV IEC Project.
- Provide leadership to the development of planning processes related to aging infrastructure and grid resilience.
- Provide leadership to the development of planning processes related to the integration of off-shore wind into the grid.
- Support the transition of responsibility to the new Vice President, Planning.

Vice President, Planning (2004 – 2019)

- The Vice President, Planning reports directly to the CEO.
- Responsible for the oversight of System Planning division of PJM which includes Transmission Planning, Interregional Planning, Interconnection Analysis, Interconnection Projects, Infrastructure Coordination and Resources Adequacy Planning.
- Develops long range strategies to achieve PJM's Planning business objectives.
- Provides overarching methodology for the monitoring and analysis of Planning studies as well as the introduction of improved and emerging technologies in the Planning space.

- Supports the leadership of the Planning organization in large and complex engineering assignments to support present and future needs of the PJM system.
- Supports the activities of PJM and industry committee or task forces involved with issues related to planning and engineering.
- Prepares board reports, presentations as well as expert testimony regarding Planning and Interconnection recommendations.
- In conjunction with subject matter experts, coordinates delivery of all communication regarding the regional transmission expansion and enhancement plans.
- Ensures the Planning division and staff can support the requests of PJM as well as external entities regarding Interconnection queue activities and feasibility studies.
- Ensures relationships with the PJM community as well as other regulatory entities are productive and in alignment with the PJM strategic plan.

Various Staff and Management Positions at PJM (1990 – 2004)

General Public Utilities Service Corporation (1987 – 1990)

System Operations

American Electric Power Service Corporation (1979 – 1987)

Bulk Transmission Planning

Expert Witness Testimony

Of

Steven R. Herling

JURISDICTION	PROCEEDING	REPRESENTING	TOPIC
Pennsylvania and Maryland CPCN			Transource 500/230 kV IEC Project
Pennsylvania and New Jersey CPCN			Susquehanna – Roseland 500 kV transmission line
West Virginia, Virginia, and Maryland CPCN			PATH 765 kV transmission line
Maryland CPCN			MAPP HVDC and 500 kV transmission lines
Virginia CPCN			Surry – Skiffes Creek 500 kV transmission line
Federal Energy Regulatory Commission (FERC)	Competitive Transmission Development Technical Conference. Docket No. AD16-18 (June 2016)	Panelist	Regional Transmission Planning and Other Transmission Development Issues. Order No. 1000 Implementation and Compliance
Federal Energy Regulatory Commission (FERC)	PJM Solution-Based DFAX Technical Conference (January 2016)	Panelist	Assignment of Cost Allocation using PJM's Solution-based Distribution Factor (DFAX) Cost Allocation Method
Federal Energy Regulatory	Technical Conference related to the	Panelist	Transmission Planning Cycles: MISO – PJM

JURISDICTION	PROCEEDING	REPRESENTING	TOPIC
Commission (FERC)	NIPSCO Complaint. Docket No. EL13-88. (June 2015)		
Federal Energy Regulatory Commission (FERC)	NIPSCO Complaint. Docket No. EL13-88. (June 2015)	Panelist	Lower Voltage Transmission Projects: Joint Planning and Cost Allocation
Federal Energy Regulatory Commission (FERC)	Docket No. ER09-1256-002 and ER12-2708-003 (April 2015)	IMO Potomac-Appalachian Transmission Highline LLC and PJM Interconnection, L.L.C.	PATH Abandonment Costs matter
Federal Energy Regulatory Commission (FERC)	Duquesne Light Company Docket No. ER13-90-002 (July 2013)	PJM Transmission Owners	Solution-based DFAX Values
Federal Energy Regulatory Commission (FERC)	Public Service Electric and Gas Company Docket No. ER13-90 (October 2012)	PJM Transmission Owners	Revision of PJM Tariff to modify the cost allocation methodology
Federal Energy Regulatory Commission (FERC)	Review of Small Generator Interconnection Agreements and Procedures Technical Conference Docket No. AD12-17 (July 2012)	Panelist	Review of Required Upgrades

Publications and Speaking Engagements

Of

Steven R. Herling

- "The Sponsorship Model" – IEEE Power & Energy Magazine – July/August 2016.
- NC Offshore Wind Conference – November 2019 – Spotlight on North Carolina's Grid Infrastructure
- AWEA Offshore WINDPOWER Conference 2019 – October 2019 – Offshore Wind – In Search of a Perfect (Inter)Connection
- Offshore Wind Transmission, US – September 2019 – Integrating Offshore Wind – RTO/ISO Perspective
- Storage Week Plus Conference – July 2019 – FERC Order 841 Rules as a Spur to Development in ISOs and RTOs
- ACES 15th Annual Members Conference – May 2019 – Transmission Impacts on Cooperatives
- Columbia University Energy Symposium – February 2019 – Towards the Future of the Grid

Committee/Organization Responsibilities

Of

Steven R. Herling

Secretary, Reliability Committee of the PJM Board of Managers

Chair, PJM Planning Committee

PJM Representative, Association of Edison Illuminating Companies

Member/Chair, ISO/RTO Council Planning Committee

Member/Vice Chair, NERC Planning Committee

Member/Chair, various NERC Subcommittees/Task Forces related to development of reliability standards

Senior Member, Institute of Electrical and Electronics Engineers

VERIFICATION

The undersigned, Steven Herling, being duly sworn, deposes and says he is President of Herling Power Grid Consulting, Inc., that he has personal knowledge of the matters set forth in the foregoing Rebuttal Testimony and the information contained therein is true and correct to the best of his information, knowledge, and belief after reasonable inquiry.

Steven Herling, Affiant

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF FAYETTE)

Sworn to, acknowledged and subscribed before me via video communications technology by Steven Herling on this 17th day of March, 2022.

Notary Public, State at Large - Kentucky
I.D. No. 607075
My Commission Expires: Aug. 25, 2022