COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application Of Kentucky Power Company For (1) A General Adjustment Of Its Rates For Electric Service; (2) Approval Of Tariffs And Riders; (3) Approval Of Accounting Practices To Establish Regulatory Assets And Liabilities; (4) A Securitization Financing Order; And (5) All Other Required Approvals And Relief	)))))))	Case No. 2023-00159

DIRECT TESTIMONY OF

TIMOTHY C. KERNS

ON BEHALF OF KENTUCKY POWER COMPANY

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CASE NO. 2023-00159

I. INTRODUCTION

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

A. My name is Timothy C. Kerns. My business address is 200 Association Drive, Charleston, WV, 25311. In March 2023, I accepted the position of Vice President of Generating Assets for Appalachian Power Company ("Appalachian Power") and Wheeling Power Company ("Wheeling Power") effective April 2023. Appalachian Power and Wheeling Power are wholly owned subsidiaries of American Electric Power Company, Inc. ("AEP"). Immediately prior to my current role, I was Vice President of Generating Assets for Kentucky Power Company ("Kentucky Power" or "the Company") and Indiana Michigan Power Company ("I&M") from 2020 to 2023.

II. BACKGROUND

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science in Mechanical Engineering Degree from West Virginia Institute of Technology and have been employed by AEP system companies for 34 years. I have worked at various power plants across the AEP System since 1989 in various positions including as a Performance Engineer, a

Maintenance Engineer, and a Plant Manager where, among other things, I performed, directed, and managed outage and non-outage maintenance and capital work. Specifically, from 1989 to 1996 I was a Performance, Maintenance and Environmental Engineer at the Philip Sporn Plant; from 1996-1998 I was an Equipment Troubleshooting Specialist for the Regional Services Organization ("RSO"); from 1998-1999 I was a Zone Superintendent for the RSO; from 1999-2000 I was a Regional Engineer Manager; from 2001 to 2006 I was the RSO Manager; from 2006-2011 I was the Plant Manager at the Tanners Creek and Lawrenceburg Plants; from 2011 to 2017 I was the Plant Manager at the Rockport Plant; from 2017 to 2020 I was the Managing Director of Generating Assets for I&M; and from 2020 to 2023 I was the Vice President of Generating Assets for Kentucky Power, Wheeling Power and I&M.

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS VICE PRESIDENT GENERATING ASSETS FOR APPALACHIAN POWER AND WHEELING POWER.

A. In my new role I am responsible for the safe, reliable, and economic operation of the fossil-fueled generating assets owned and operated by the Companies. This includes the Amos, Mitchell, and Mountaineer coal-fired power plants, as well as the gas-fired Ceredo (simple-cycle combustion turbines), Clinch River (gas-fired boiler), and Dresden (combined-cycle) power plants, and Appalachian Power's hydro facilities. Specifically, I plan, organize, coordinate, direct, and control plant activities, including the operations, maintenance, engineering, and construction of the plant facilities. I also oversee plant budgets and interface with other AEP functional groups such as Accounting, Regulatory, and Commercial Operations to ensure the needs of the generating plants are met. Additionally, I am responsible for any decommissioning, demolition, and disposition of generating assets owned or operated by the Companies.

Q. PLEASE EXPLAIN YOUR FAMILIARITY WITH KENTUCKY POWER GENERATING ASSETS.

A. In my former role as Kentucky Power's Vice President of Generating Assets, I was responsible for the safe and reliable operation of Big Sandy Unit 1 and Mitchell Units 1 and 2 for over three years. More importantly, I was in the role throughout the test year for this proceeding.

Prior to the adoption of the resolutions identified in the Written Consent Action of the Mitchell Operating Committee, Kentucky Power was Mitchell Plant's operator until September 1, 2022. Until that time, I also had overall responsibility for the operation and maintenance of the Plant as the Company's Vice President of Generating Assets. I continue to have these responsibilities in my current role on behalf of Wheeling Power now that Wheeling Power is the operator for the Mitchell Plant. I am familiar with the day to-day operation of the Mitchell Plant as a result of my responsibilities in the oversight of Plant personnel in connection with the safe, reliable, and economic operation of the Plant. In this regard, my responsibilities include interacting on a regular basis with the Mitchell Plant manager, who reports directly to me, as well as with other Plant personnel in connection with both day-to-day and longer-term Plant activities. In addition, I regularly review budgets, review investments, and help plan the safe and reliable operation of that facility. I also continue to participate as a non-voting member of Mitchell Plant Operating Committee.

Lastly, as part of Wheeling Power's management team, I work in close coordination with the American Electric Power Service Corporation ("AEPSC") and Kentucky Power's Managing Director of Generating Assets to ensure the Mitchell Plant is safe, reliable and provides benefit to customers through effective management of O&M expenditures and capital investments.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN ANY REGULATORY PROCEEDINGS?

A. Yes. I have submitted testimony and testified on behalf of Kentucky Power before this Commission in Case Nos. 2020-00174 (2020 base rate case) and 2021-00421 (Mitchell Plant operating agreements). I have also submitted testimony on behalf of Wheeling Power before the West Virginia Public Service Commission ("WVPSC") in Case No. 21-0810-E-PC. In addition, I have submitted testimony and testified on behalf of I&M before the Indiana Utility Regulatory Commission in Cause Nos. 44967, 44511, and 45235, and the Michigan Public Service Commission in Cause Nos. U-18370, U-20070, and U-20359. Finally, I submitted testimony at the Federal Energy Regulatory Commission in AEP Generating Company's depreciation rate cases.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to:

- Describe Kentucky Power's generation assets;

- Describe and support the reasonableness of Kentucky Power's generation non-fuel, non-labor operation and maintenance ("O&M") expenses for the Mitchell and Big Sandy Plants;
- Describe the retired Big Sandy generating assets;
- Describe capital investments placed in-service at Kentucky Power's generating assets since the Company's last base case; and
- Describe the performance of the Company's generation fleet during Winter Storm Elliott.

Q. WHAT IS THE TEST YEAR FOR THIS PROCEEDING?

A. The test year in this proceeding is the twelve-month period from April 1, 2022 through March 31, 2023.

Q. ARE YOU SPONSORING ANY EXHIBITS AS PART OF YOUR TESTIMONY?

A. Yes. I am sponsoring the following exhibits attached to my testimony:

EXHIBIT	DESCRIPTION
Exhibit TCK-1	Company's Response to Commission's Staff Set 1, Question 6 In Case No. 2023-00145

IV. KENTUCKY POWER'S GENERATING ASSETS

Q. PLEASE DESCRIBE KENTUCKY POWER'S GENERATION ASSETS.

A. Kentucky Power's generation assets consisted of both owned and contracted generation capacity totaling 1,468 MW until December 7, 2022. Beginning December 7, 2022 through the 2022/2023 PJM planning year ending May 31, 2023, Kentucky Power's owned and contracted generation capacity totaled approximately 1,227 MW under the terms and conditions of the Power Coordination Agreement ("PCA").

Q. PLEASE BRIEFLY DESCRIBE KENTUCKY POWER'S OWNED GENERATION.

A. Kentucky Power's generation assets consist of a total of 1,075 MW of capacity from two generating plants, Big Sandy and Mitchell. The Company's assets and their characteristics are listed in Figure TCK-1.

Figure TCK-1: Kentucky Power Generation Assets

Plant	Kentucky Power-Owned Capacity (MW)	No. of Units	Location	Fuel	Expected Retirement Date
Big Sandy	295	1	Louisa, KY	Natural Gas	2031
Mitchell	780	2	Moundsville, WV	Coal	2040

Kentucky Power owns and operates the Big Sandy Plant located near Louisa, Kentucky. The plant currently has a single operating unit with a generating capacity of 295 MW. Big Sandy Unit 1 was originally placed in service in 1963 and operated as a 278 MW sub-critical coal-fired generating unit through mid-November 2015. As approved by the Commission in Case No. 2013-00430, and described later in my testimony, Big Sandy Unit 1 was converted to a natural gas-fired unit and returned to service May 31, 2016. The Unit is equipped with low nitrogen oxide ("NO_x") burners with overfire air for reduction of NO_x emissions.

The Mitchell Plant is located approximately 12 miles south of Moundsville, West Virginia on the Ohio River. Kentucky Power owns an undivided 50% interest in the Mitchell Plant; the other 50% interest is owned, and operated, by Wheeling Power. The plant comprises two super-critical pulverized coal-fired baseload generating units. Mitchell Unit 1 has a capacity of 770 MW and Mitchell Unit 2 has a capacity of 790 MW for a total capacity of 1,560 MW. Both Units were placed in service in 1971.

Q. PLEASE DESCRIBE WHAT COMPRISES KENTUCKY POWER'S CONTRACTED GENERATION.

A. Kentucky Power was a party to a unit power agreement ("UPA") with AEP Generating Company for power from the Rockport Plant that terminated December 7, 2022. The Rockport Plant is located along the Ohio River in southern Indiana and consists of two supercritical pulverized coal-fired generating units. Kentucky Power's contractual share of the Rockport output totaled 393 MW. Upon termination of the Rockport UPA, the Company forecasted that it would require 152.4 MW of replacement capacity through the 2022/2023 PJM planning year ending May 31, 2023 that would be obtained through the PCA between Kentucky Power and AEP's Operating Companies.

Q. HAVE THE RETIREMENT DATES FOR BIG SANDY UNIT 1 OR MITCHELL GENERATING UNITS CHANGED?

A. There have been no changes to the expected retirement dates of either Big Sandy Unit 1 or the Mitchell Plant. With continued investment and maintenance, Big Sandy Unit 1 is expected to reach its current retirement date of 2031 and the Mitchell plant is expected to reach its retirement date of 2040. However, it is my understanding that, based on its recently filed Integrated Resource Plan, the Company is proposing to operate Big Sandy Unit 1 through 2041. Additionally, as a result of the Commission's Order in Case No. 2021-00004 denying a Certificate for Public Convenience and Necessity ("CPCN") for Effluent Limitation

Guidelines ("ELG") projects at Mitchell Plant, Kentucky Power's interest in Mitchell will terminate in 2028.

Q. PLEASE DESCRIBE THE KENTUCKY POWER GENERATING ASSETS THAT HAVE BEEN RETIRED.

A. Due to EPA's Mercury and Air Toxics ("MATS") Rule, Big Sandy Unit 2, an 800MW coal-fired generating asset, was retired in May 2015 and Big Sandy Unit 1 was converted from coal-fired to natural gas-fired in May 2016. The fuel conversion allowed Big Sandy Unit 1 to continue to operate in compliance with the stringent air emission requirements of MATS. There were coal-related assets for Big Sandy Unit 1 that were retired since they were not required for its natural gas operations.

Demolition activities at Big Sandy Unit 2 began in 2016. Since that time, the dismantlement of coal handling equipment and the demolition of its cooling tower, turbine building, boiler house, and environmental equipment have been completed. Currently, fly ash pond post-closure monitoring activities and asbestos abatement continue at the Big Sandy Plant. The going-forward coal-related decommissioning ARO costs associated with the fly ash pond and asbestos abatement for Big Sandy Unit 2 are identified by Company Witness Whitney.

Big Sandy Unit 1, although converted to a natural gas generating asset in 2016, had some equipment solely related to its operation as a coal-fired facility. Examples of Big Sandy Unit 1's coal-related assets included the coal yard and its associated equipment, the conveyors and silos which transferred coal from the coal yard to the plant, the coal pulverizers, the Electrostatic Precipitators ("ESP"), and the fly ash and bottom ash handling systems. This equipment was no longer necessary when the unit began operating as a natural gas unit and was retired once the unit no longer operated as a coal-fired facility.

V. KENTUCKY POWER GENERATION O&M

Q. WHAT ARE THE O&M REQUIREMENTS OF KENTUCKY POWER'S GENERATION ASSETS?

A. Kentucky Power's plants must provide safe, economical, and reliable generation output to serve load and accommodate fluctuating customer needs. In addition, a unit's maintenance needs vary based on its type, design, age, condition, and operational characteristics. All units are maintained to maximize operations, and to do so in a safe manner in compliance with all local, state, and federal regulations.

Q. HOW ARE O&M COSTS CONTROLLED AT THE PLANTS?

A. To minimize O&M expenses, Kentucky Power relies on a system of maintenance and operations management programs to ensure optimal performance of the generating assets. These maintenance programs are:

- Predictive Maintenance: monitoring, inspections, and/or data analyses conducted to diagnose potential maintenance issues early and usually while the equipment is running to minimize downtime.
- Preventive Maintenance: protocols, testing, and physical work conducted on equipment to address anticipated or diagnosed vulnerabilities.

In addition, continuous improvements are incorporated into the operations and maintenance of the generating units to eliminate waste and increase process efficiencies. Together, these maintenance and operations management programs help to optimize operation of the assets and limit O&M cost escalations.

Q. WHAT IS KENTUCKY POWER'S TEST YEAR LEVEL OF GENERATION O&M EXPENSE?

A. Kentucky Power's non-fuel, non-consumables, non-labor test year Generation O&M expense is $27.634 million. As shown in Figure TCK-2 below, Kentucky Power's test year Generation O&M expenses include steam maintenance and steam operations amounts for Big Sandy, the Company's 50% undivided interest in Mitchell, and shared plant costs not attributable to a specific generating unit (known as Non-Plant costs).

TCK-2: Test Year Kentucky Power Non-Fuel, Non-Consumables, Non-Labor Test Year Generation O&M*

Category	Big Sandy Plant	Mitchell Plant	Non-Plant	Total
Steam Maintenance	$5,954,613	$12,408,247	$212,067	$18,522,160
Steam Operations	$1,570,122	$4,911,699	$2,629,917	$9,111,737
Total:	$7,524,734	$17,319,946	$2,841,984	$27,633,897

*Total may not sum due to rounding

Q. DOES THE TOTAL AMOUNT OF $27.634 MILLION REPRESENT AN APPROPRIATE AND REASONABLE ONGOING LEVEL FOR O&M FOR KENTUCKY POWER'S GENERATION ASSETS?

A. Yes. This total level is reasonable and fairly reflects an appropriate level of O&M for Big Sandy and Kentucky Power's undivided 50% share of the Mitchell Plant.

VI. GENERATION CAPITAL ADDITIONS

Q. PLEASE PROVIDE AN OVERVIEW OF GENERATION CAPITAL ADDITIONS PLACED IN-SERVICE SINCE THE COMPANY'S LAST BASE CASE.

A. As shown in TCK-3 below, Kentucky Power had steam and other generation plant related capital additions totaling approximately $44.167 million placed in-service since the Company's last base case. Of that amount, $11.221 million is associated with major fossil fuel generation capital projects and $22.529 million that is associated with Production Plant Blanket ("PPB") capital projects.

Allocations to Kentucky Power's fossil fuel generation organization for intangible projects (information technology projects that are not associated with physical capital additions at Kentucky Power's plants but provide benefits to Kentucky Power) account for a combined total of approximately $11.551 million. General capital additions that support plant operations account for approximately $456 thousand. The remaining fossil fuel generation capital amounts include Asset Retirement Obligation ("ARO") estimates that resulted in a reduction of approximately $1.590 million to capital additions.

Figure TCK-3 is inclusive of all environmental project capital additions placed in-service since the last base case. However, all environmental project costs associated with ESP, Selective Catalytic Converter Reduction ("SCR"), and Dry Sorbent Injection ("DSI") capital additions are collected through Environmental Compliance Plan ("ECP") Company filings as discussed by Company Witness Kahn.

Figure TCK-3: Generation Capital Additions
April 2020 – March 2023

Plant	Project Description	Addition to Plant ($)
Big Sandy Plant	**Fossil Fuel Major Projects**	
	(Non-Environmental)	
	North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) Physical Security Upgrade	$519,594
		$519,594
	(Environmental)	
	Repurpose Big Sandy Bottom Ash Pond (BAP)	$417,077
		$417,077
	Big Sandy Fossil Fuel Major Projects Sub-Total:	**$936,672**
	Other Fossil Generation Capital Projects	
	Production Plant Blanket Projects:	$5,811,279
	Non-Environmental	$5,808,906
	Environmental	$2,373
	ARO	$2,752,924
	Big Sandy Other Fossil Generation Capital Projects Sub-Total:	**$8,564,203**
Big Sandy Plant Total		**$9,500,875**
Mitchell Plant (Kentucky Power Share)	**Fossil Fuel Major Projects**	
	(Non-Environmental)	
	Mitchell Unit 2 Cooling Tower Components Replacement	$2,772,398
	Mitchell Unit 2 Air Heater Basket Replacement	$2,077,824
	Mitchell Unit 1 - Phase 2 Generator Step-up (GSU) Transformer Replacement	$13,416
		$4,863,638
	(Environmental)	
	Mitchell Unit 2 Electrostatic Precipitator (ESP)Upgrades	$2,115,185
	Mitchell Unit 1 Selective Catalytic Converter (SCR) Catalyst Layer 4 Replacement	$1,357,439
	Mitchell Unit 0 Dry Sorbent Injection (DSI) Lime Conversion	$1,326,811
	Mitchell Landfill Expansion -Phase 3	$587,858
	Mitchell Unit 1 SCR Catalyst Layer 3 Replacement	$27,976
	Mitchell Unit 2 - SCR Catalyst Layer 3 Replacement	$5,483
		$5,420,752
	Mitchell Fossil Generation Capital Projects Sub-Total:	**$10,284,390**
	Other Fossil Generation Capital Projects	
	Production Plant Blanket Projects	$16,718,190
	Non-Environmental	$13,365,463
	Environmental	$3,352,727
	ARO	($4,343,418)
	Mitchell Other Fossil Generation Capital Projects Sub-Total:	**$12,374,772**
Mitchell Plant Total		**$22,659,162**
Various Facilities	Intangible Capital Projects	$11,551,194
	General Capital Projects	$456,050
Various Facilities Total		**$12,007,244**
Total Kentucky Power Capital Additions		**$44,167,280**

Q. PLEASE SUMMARIZE INDIVIDUAL MAJOR FOSSIL FUEL GENERATION CAPITAL PROJECT ADDITIONS OVER $1 MILLION INCLUDED IN FIGURE TCK-3 AND EXPLAIN WHY THEY WERE NECESSARY.

A. A summary of individual major fossil fuel generation capital project additions over $1 million reflected in TCK-3 and associated necessities are summarized below.

Mitchell Major Capital Projects

Non-Environmental

- Mitchell Unit 2 Cooling Tower Components – Some of the Cooling Tower components had reached the end of their useful life after 30 years of service and some components had deteriorated to a point where they would not last another 5-years without failing. This project replaced the Hot Water Distribution deck, louvers and louver columns, outer periphery longitudinal girts, and other associated components.
- Mitchell Unit 2 Air Heater Basket Replacement –The air heater baskets were one year beyond their typical life cycle and were beginning to deteriorate exponentially. As a result, Mitchell Unit 2 was beginning to experience increases in its equivalent forced outage rate ("EFOR") associated with the baskets. The existing air heater baskets have been replaced with new air heater baskets.

Environmental

- Mitchell Unit 2 ESP Upgrades – Upgrades required to comply with particulate matter emission limits and the state of West Virginia 10% opacity limit. The scope of the project included:
  - the installation of a new heated purge air system;
  - repair and replacement of corroded ESP sidewall casing, hopper casing, and ductwork as needed;
  - removal and replacement of the hot and cold roof, including insulation, for approximately half of the precipitator;
  - replacement of the discharge electrode support insulators as needed;
  - repair of the collecting and discharge electrode rapper system; and
  - replacement of the hopper level detection system.
- Mitchell Unit 1 SCR Catalyst Layer 4 Replacement – 4th layer SCR catalyst replacement was required to maintain desirable NOx removal effectiveness. NOx emissions are subject to the New Source Review ("NSR") Consent

Decree and Cross-State Air Pollution Rule ("CSAPR"). The catalyst layer replacement will also maintain effective mercury oxidation across the SCR catalyst reactor.

- Mitchell Units 0 DSI Lime Conversion Project – Mitchell Plant currently uses Trona for SO_3 mitigation. The project reconfigured the existing DSI system for Mitchell Units 1 and 2 to more efficiently handle hydrated lime in lieu of Trona, and reduce issues related to corrosion, as well as gain benefits such as heat rate improvement, improved Equivalent Unplanned Outage Rate ("EUOR"), and a lower minimum load. Conversion to lime also allows for the use of a higher percentage of high sulfur coal which has historically been cheaper than the lower sulfur coal, thereby resulting in lower overall fuel costs. The project also installed a new distributed control system for the DSI.

Q. WHAT ARE PPB PROJECTS?

A. PPB projects are capital projects necessary to provide for the safe, environmentally responsible, reliable, and efficient operation of our generating units. They are sometimes referred to as 'Maintenance Capital' projects. These projects are placed into two categories, major or minor. Major plant blanket projects will have a total cost of over $1,000,000, but under $3,000,000. Minor plant blanket projects, the vast majority of which are smaller component replacements and installations, are projects that have a total cost of under $1,000,000.

When evaluating these PPB projects, Kentucky Power looks for cost savings whenever possible without jeopardizing reliability and safety. All PPB projects over $1 million are also reviewed and approved through AEPSC's Strategic Capital Prioritization Process ("SCPP") which includes review and approval by AEP's Vice President (VP) of Project Solutions, VP of Engineering

Service, VP of Generation Shared Services, VP of Appalachian Power Company/ Wheeling Power Company Generating Assets, and VP of Southwestern Power Company Generating Assets.

Q. PLEASE DESCRIBE SOME OF THE PPB CAPITAL ADDITIONS OVER $1 MILLION SINCE THE LAST BASE CASE AT KENTUCKY POWER PLANTS.

A. The major PPB projects for the Big Sandy and Mitchell Plants are listed below:

Big Sandy Major PPB Capital Projects

- Big Sandy Unit 1 Generator Stator Re-wedge – The generator stator was last re-wedged in 2008 and upon inspection in fall 2022, it was determined the stator required another re-wedge in order to mitigate the potential risk of a premature stator failure and thereby enhance the reliability of the generator. A stator failure would have left the Unit in a forced state of being unable to operate for a period of one year or more due to long lead time materials.

Mitchell Plant Major PPB Capital Projects

- Mitchell Unit 2 SCR Catalyst Layer 4 Replacement – Need for the replacement of the catalyst 4th layer was due to normal deactivation over thousands of hours of run time. SCR NOx removal effectiveness requires adequate activity levels. SCR NOx performance is required for compliance with the NSR Consent Decree requirements and CSAPR regulations.

Q. PLEASE SUMMARIZE THE INTANGIBLE CAPITAL INVESTMENTS

A. Intangible capital projects are routine software updates and new programs that increase the efficiency of Kentucky Power's Generation organization.

Q. ARE EXPENSES RELATED TO ELG COMPLIANCE AT MITCHELL INCLUDED UNDER PPB PROJECTS OR INCLUDED IN O&M EXPENSES?

A. No. As I stated earlier in my testimony, this Commission did not approve the CPCN to execute ELG projects required by EPA to comply with its revisions to the ELG rule effective October 2020 at the Mitchell Units; therefore, Kentucky Power is not authorized to recover costs related to ELG compliance projects at Mitchell.

Q. HOW DOES THE COMPANY ENSURE ELG-RELATED COSTS ARE NOT CHARGED TO KENTUCKY POWER SINCE THIS COMMISSION ONLY APPROVED COAL COMBUSTION RESIDUALS ("CCR") PROJECT UPGRADES?

A. Pursuant to the September 1, 2022 Written Consent Action of the Mitchell Operating Committee, which is included as Exhibit V of Section II of the Company's Application, the Company hired Burns & McDonnell, an independent engineering, architecture construction, environmental consulting firm, to perform an assessment of the scope of work directly related to the CCR and ELG projects for the purpose of determining the appropriate allocation of CCR and ELG related costs. As a result of and in accordance with Burns & McDonnell's assessments, the Company established work orders to ensure costs related to the scope of work for each of the CCR and ELG projects are appropriately charged.

VII. GENERATION PERFORMANCE DURING WINTER STORM ELLIOTT

Q. PLEASE DESCRIBE WINTER STORM ELLIOTT.

A. As explained further by Company Witness Vaughan, Winter Storm Elliott was a bomb cyclone[1] that impacted the PJM region from December 23, 2022 through December 27, 2022 (the "Winter Storm Elliott Period"), causing extreme cold weather, including blizzards, high winds, and snow.

Q. WERE THE COMPANY'S GENERATION ASSETS AVAILABLE AND OPERATING DURING THE WINTER STORM ELLIOTT PERIOD?

A. Both Mitchell Unit 1 and Unit 2 (collectively, the "Mitchell Units") were available and operating throughout the Winter Storm Elliott Period. As shown in Exhibit TCK-1, Mitchell Unit 1 had a Net Capacity Factor[2] ("NCF") of 80.3% and Mitchell Unit 2 had an NCF of 74.1% during the Winter Storm Elliott Period. Big Sandy Unit 1 was in a Planned Outage and was unavailable.

Q. HOW DOES THE MITCHELL PLANT PREPARE FOR WINTER?

A. In preparation for winter, the Mitchell Plant implements a "Winter Preparedness Plan." In 2022, the plant implemented the "Winter Preparedness Plan" starting on October 3, 2022. The standard plan included employee training, completing preventative maintenance work orders, performing equipment checks, replenishing supplies, and other winter preparedness activities. Plant personnel completed a cold weather site specific plan review on October 19, 2022 and completed training on the North American Electric Reliability Council cold weather reliability standards

[1] A bomb cyclone is a large, intense storm that rapidly intensifies and is defined by a sudden and significant drop in atmospheric pressure.

[2] Net Capacity Factor is defined as the ratio of the generating unit's ((net actual generation) to its net maximum capacity for the number of hours in the period being reported that the unit was in the active state) x 100%.

by October 31, 2022. Cold Weather Preparedness and Winterization checks conducted as preventative maintenance activities were completed by November 2, 2022.

Q. DID THE MITCHELL PLANT TAKE ANY ADDITIONAL PREPARATORY STEPS IN ADVANCE OF WINTER STORM ELLIOTT?

A. Yes. In anticipation of Winter Storm Elliott, Mitchell Plant staffing was increased to at least one on-site member from the plant leadership team and additional plant operations personnel and contractor support were brought on site.

Q. HOW DID THE MITCHELL UNITS PERFORM DURING WINTER STORM ELLIOTT?

A. Both Mitchell Units performed well during the Winter Storm Elliott Period. Both Units had a 0% forced outage factor[3] and 0% maintenance outage factor[4], meaning at no point during the event were either of the Mitchell Units unavailable.

Q. WAS EITHER UNIT'S OUTPUT REDUCED (OR DERATED) DURING WINTER STORM ELLIOTT?

A. Yes, at times, both Mitchell Units experienced derates due to operational issues. A "derate" is defined as a decrease in the available capacity of an electric generating unit, commonly due to a system or equipment modification or environmental, operational, or reliability considerations. As demonstrated in Exhibit TCK-1, a significant portion of the derates experienced at both Mitchell Units were required to comply with particulate matter emission limits and the state of West Virginia's

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[3] Forced outage factor is the ratio of ((All hours experienced during forced outages) to the number of hours in the period being reported that the unit was in the active state) x 100%.

[4] Maintenance outage factor is the ratio of ((All hours experienced during maintenance outages) to the number of hours in the period being reported that the unit was in the active state) x 100%.

10% opacity limit. The opacity-related derates were not driven by Winter Storm Elliott. Mitchell Unit 1 also had a small 35 MW derate related to a boiler clinker for the duration of the Winter Storm Elliott Period.

The remaining derates were caused by frozen coal causing the coal conveyor to trip out, freezing of slurry feed tanks, and a pulverizer damper operation issue. This group of derates lasted a combined total of only 20.31 of the 240 hours of operation between both Mitchell Units during the Winter Storm Elliott Period.

During Winter Storm Elliott, Unit 1 had an equivalent availability factor[5] ("EAF") of 86.3%, and Unit 2 had an EAF of 78.4%.

Q. HOW DOES THE MITCHELL PLANT'S PERFORMANCE DURING WINTER STORM ELLIOTT COMPARE TO ITS HISTORICAL PERFORMANCE?

A. Both Mitchell Units performed favorably during Winter Storm Elliott as compared to their historic performance, as Figure TCK-4 demonstrates.

[5] Equivalent Availability factor is the ratio of ((Available hours – equivalent planned derated hours – equivalent unplanned derated hours – equivalent seasonal derated hours) to the number of hours in the period being reported that the unit was in the active state) x 100%.

Figure TCK-4: Mitchell Unit Performance:
Winter Storm Elliott Period Compared to 2016-2021

Mitchell Unit	Winter Storm Elliott Period Net Capacity Factor ("NCF")	Average NCF (2016-2021)	Highest NCF (2016-2021)	Winter Storm Elliott Period Average Availability Factor ("EAF")	Average EAF (2016-2021)	Highest EAF (2016-2021)
Unit 1	80.3%	36.9%	52.%	86.3%	57.1%	68.1%
Unit 2	74.1%	46.6%	65.8%	78.4%	69.3%	84.4%

As demonstrated above, Unit 1's NCF and EAF and Unit 2's NCF during the Winter Storm Elliott Period were higher during Winter Storm Elliott that their 6-year highest annual levels. Both Units' NCF and EAF during the storm period far exceeded their 6-year averages.

Q. COULD THE COMPANY REASONABLY HAVE DONE ANYTHING DURING THE WINTER STORM ELLIOTT PERIOD TO INCREASE THE OUTPUT OF THE MITCHELL GENERATING FACILITIES?

A. No. Again, it is important to reiterate that, although the Mitchell Units were derated during Winter Storm Elliott, at no point was either Mitchell Unit unavailable to serve customers. Furthermore, the Company cannot legally operate the Mitchell Units in a manner that would violate the particulate matter emission limits and the state of West Virginia's 10% opacity limit. The remaining non-opacity related derates were short in duration but were required to allow for the necessary repairs to be made while keeping the Units available. As such, when both Mitchell Units were needed during this extreme event, they were available and performed well, to the benefit of Kentucky Power customers.

Q. PLEASE DESCRIBE THE PLANNED OUTAGE AT BIG SANDY DURING WINTER STORM ELLIOTT.

A. Big Sandy Unit 1 began a Planned Outage on September 109, 2022. The outage was originally scheduled to be completed on December 4, 2022, but had to be extended several times through January 14, 2023 for a number of reasons including additional time required to repair the generator due to hot spots in the core, replacement of the generator rotor collector end retaining ring due to a crack discovered during the outage, the repair of the hydrogen seal housing at the exciter due to a leak, and the need to repair an unexpected condenser leak identified at start-up. The extensions to the outage were necessary to repair and/or replace generator components to prevent the risk of a catastrophic failure of the generator as well repair the condenser to allow the Unit to restart and avoid future forced outages. The timeline for the Company's outage extension request to PJM is discussed later in my testimony. Each extension for the Big Sandy fall 2022 outage was approved by PJM.

Q. WHAT IS A PLANNED OUTAGE?

A. A Planned Outage is a generating unit outage of a predetermined duration that can last for several weeks and occurs only once or twice a year. Typically, these events consist of a known scope of work and duration that is estimated prior to the outage being scheduled.

Q. HOW ARE PLANNED OUTAGES SCHEDULED?

A. Planned Outages are scheduled well in advance (months and sometimes even years) due to significant scope, equipment lead time, engineering, and time out of operation. Such outages are planned in conjunction with PJM and with PJM's approval. The Company schedules Planned Outages during the shoulder months attempting to avoid, to the extent practical, multiple units simultaneously in a Planned Outage.

Q. WHEN A UNIT IS IN A PLANNED OUTAGE, IS IT POSSIBLE TO QUICKLY RETURN THE UNIT TO SERVICE IF MARKET CONDITIONS CHANGE?

A. Generally, it is not. During a Planned Outage, a generating unit is often at least partly dismantled, often with pressure parts (parts that contain steam at very high pressures and temperatures when operating, such as boilers, turbines, etc.) taken apart to be inspected, maintained, and/or replaced. It is very difficult if not impossible to safely and quickly return a unit to service or deviate from the work plan for the outage, particularly when major equipment is disconnected or dismantled for repair at that time.

Q. PLEASE DESCRIBE THE SCOPE OF WORK THAT WAS TO BE COMPLETED DURING THE PLANNED OUTAGE AT BIG SANDY UNIT 1.

A. As originally scoped, the fall 2022 Planned Outage at Big Sandy Unit 1 included a generator field out inspection and a possible re-wedge of the Unit's stator.[6] The Company was, in fact, required to completely re-wedge the stator as part of this scope of work.

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[6] The stator is the stationary part of a rotary system found in electric generators. In an electric generator, the stator converts the rotating magnetic field to electric current.

Q. WHY DID BIG SANDY'S OUTAGE EXTEND BEYOND ITS PLANNED OUTAGE END DATE?

A. In November 2022, the Company extended the Planned Outage at Big Sandy Unit 1 to December 12, 2022, as it needed additional time to complete the original scope of work. Then, on November 13, 2022, the Company discovered a crack on the generator rotor collection end retaining ring and determined that the retaining ring required replacement prior to returning the Unit to service. In order to complete that repair, on December 2, 2022, the Company requested the Planned Outage at Big Sandy Unit 1 be extended through December 30, 2022. PJM approved the extension on December 26, 2022. The Planned Outage was extended twice more for a hydrogen seal leak identified during an air leakage test and a condenser leak discovered during start up. These extensions were requested on December 22, 2022, and January 10, 2023, and were approved by PJM on December 28, 2022, and January 11, 2023, respectively.

Q. COULD THE COMPANY HAVE PLACED BIG SANDY UNIT 1 IN SERVICE WITHOUT ADDRESSING THE ITEMS THAT CAUSED THE PLANNED OUTAGE TO BE EXTENDED THROUGH THE WINTER STORM ELLIOTT PERIOD?

A. No, it could not. First, as explained further above, extending the outage to replace the retaining ring extended the Planned Outage through what became the Winter Storm Elliott Period. If the Company had not replaced that retaining ring, Big Sandy Unit 1 would have been at an increased risk of catastrophic failure. Therefore, the Company could not have safely placed the Unit back in service and operated it without replacing the retaining ring. It likewise could not have put the Unit safely back in service without fixing the hydrogen seal and condenser leaks.

Q. WAS THERE ANY WAY FOR THE COMPANY TO HAVE KNOWN ABOUT THE WINTER STORM ELLIOTT EVENT WHEN IT REQUESTED THE PLANNED OUTAGE EXTENSION ON DECEMBER 2, 2022.

A. No.

Q. WERE THE COMPANY'S ACTIONS RELATED TO EXTENDING THE BIG SANDY UNIT 1 OUTAGE REASONABLE?

A. Yes. The Company could not have brought Big Sandy Unit 1 back online to serve customers during Winter Storm Elliott without risking a catastrophic failure of the Unit as all the repairs described above were required to be completed in order to safely operate the Plant. Therefore, it was reasonable to extend the planned outage to ensure the Unit would be in good working order to service customers into the future.

VIII. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

DATA REQUEST

KPSC 1_6 Provide a detailed explanation of how Kentucky Power's generating units were operating during Winter Storm Elliott. Include in the response a list and event description in chronological order showing by unit and date any scheduled, actual, and forced outage for the months of November and December 2022.

RESPONSE

Winter Storm Elliott began in the Pacific Northwest on December 20, 2022 and moved east at a rapid pace becoming a bomb cyclone, an area of low pressure that intensifies rapidly, and entering the PJM territory on December 23, 2022. Winter Storm Elliott impacted the PJM territory from December 23, 2022 until December 27, 2022. During that period, none of the Company's generating units were forced from service.

Big Sandy Unit 1 was in its Planned Outage (9/9/22 – 1/14/23) which was extended from its planned end date of 12/12/2022 due to emergent generator repair work discovered during its reassembly. The completion of this work was required so the unit could be returned to service and operated safely and reliably.

Both Mitchell units operated continuously throughout the Winter Storm Elliott period (12/23/2022 – 12/27/2022). At times during that period, each of units' output was reduced (or derated) due to operational issues. Those deratings resulted in Net Capacity Factors (NCF) of 80.3% and 74.1% for Units 1 and 2, respectively and were largely unrelated to the extreme weather.

Table 1 below describes the performance of the Company's generating units during the period.

Kentucky Power Company
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Table 1. KPCo Unit Performance During the 5 day Winter Storm Elliott Period (12/23/2022 - 12/27/2022)

	Equivalent Forced Outage Rate (EFOR)	Equivalent Availability Factor (EAF)	Net Capacity Factory (NCF)
Big Sandy Unit 1	0.0%	0.0%	0.0%
Mitchell Unit 1	13.7%	86.3%	80.3%
Mitchell unit 2	21.6%	78.4%	74.1%

Performance Metric Definitions
Equivalent Forced Outage Rate (EFOR)[1] - The ratio of unit's forced outage hours + derates to the its forced outage hours + service hours expressed as a percentage.
Equivalent Availability (EAF)[1] - The ratio of the unit's available hours - all derate hours to the number of hours in the period.
Net Capacity Factor (NCF)[1] - The ratio of the unit's net generation to it maximum potential outputfor the period.
[1] Formal definitions and equations for performance metrics can be found in the ***NERC 2023 Data Reporting Instructions - Appendix F***

Attachment KPCO_R_KPSC_1_6_Attachment1 lists the curtailing (derating) events for the period by unit and in chronological order.

Attachment KPCO_R_KPSC_1_6_Attachment2 lists the forced, maintenance and planned outages in chronological order for the months of November and December 2022.

Witness: Robert A. Jessee

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	Event Type Code *								
Unit Name	Outages	Curtail.	Event Start	Event End	Event Description	MW Reduction	Period Elapsed Loss (MWH)	Event Number	Event Elapsed Time (Hours)
Big Sandy 1	PO		09/09/22 11:00 PM	01/14/23 11:47 AM	Boiler i/r, Generator Field Out inspection/possible rewedge, Turbine Valve i/r, Corrosion Fatigue i/r, Cooling Tower i/r, ReHeat Attemperator i/r, Gas valve i/r, FD Fan and Motor i/r, High Energy Piping (HEP) i/r, Flow Accelerated Corrosion (FAC) i/r, Core Loop testing.	295	35,448	71	119.98
Mitchell 1		D3	12/22/22 12:00 AM	12/30/22 12:00 AM	Large clinker growing on North side of Boiler	35	4,200	948	119.98
Mitchell 1		D1	12/24/22 06:48 AM	12/24/22 07:06 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	465	140	949	0.30
Mitchell 1		D1	12/24/22 07:06 AM	12/24/22 07:43 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	97	60	950	0.62
Mitchell 1		D1	12/24/22 07:43 AM	12/24/22 08:20 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	465	287	951	0.62
Mitchell 1		D1	12/24/22 08:20 AM	12/24/22 12:00 PM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	140	514	952	3.67
Mitchell 1		D1	12/24/22 01:48 PM	12/24/22 07:34 PM	Opacity	80	462	953	5.77
Mitchell 1		D1	12/24/22 07:34 PM	12/25/22 09:00 AM	Opacity	90	1,210	954	13.43
Mitchell 1		D1	12/25/22 10:07 AM	12/25/22 12:31 PM	Frozen lumps of coal causing conveyor trip out outs	135	324	955	2.40
Mitchell 1		D1	12/26/22 12:20 AM	12/26/22 08:29 AM	Opacity	45	368	956	8.15
Mitchell 1		D1	12/26/22 08:29 AM	12/26/22 08:46 AM	Opacity	60	17	957	0.28
Mitchell 1		D1	12/26/22 08:46 AM	12/27/22 12:00 AM	Opacity	85	1,296	958	15.23
Mitchell 1		D3	12/27/22 12:00 AM	12/27/22 01:40 AM	Opacity	85	142	959	1.67
Mitchell 1		D3	12/27/22 01:40 AM	12/27/22 02:02 AM	Opacity	135	50	960	0.37
Mitchell 1		D3	12/27/22 02:02 AM	12/27/22 02:53 AM	Opacity	155	132	961	0.85
Mitchell 1		D3	12/27/22 02:53 AM	12/27/22 04:43 AM	Opacity	185	339	962	1.83
Mitchell 1		D3	12/27/22 04:43 AM	12/27/22 07:22 AM	Opacity	205	544	963	2.65
Mitchell 1		D3	12/27/22 07:22 AM	12/27/22 11:03 AM	Opacity	235	866	964	3.68
Mitchell 1		D3	12/27/22 11:03 AM	12/28/22 12:00 AM	Opacity	245	3,174	965	12.93
Mitchell 2		D1	12/23/22 10:10 AM	12/23/22 10:28 AM	25 Pulv issue	95	29	908	0.30
Mitchell 2		D1	12/23/22 10:28 AM	12/23/22 05:44 PM	25 Pulv issue, could not get dampers to operate	90	654	910	7.27
Mitchell 2		D1	12/23/22 12:07 PM	12/23/22 01:56 PM	Opacity	25	46	909	1.82
Mitchell 2		D1	12/23/22 01:56 PM	12/23/22 02:53 PM	Opacity	50	48	913	0.95
Mitchell 2		D1	12/23/22 02:53 PM	12/23/22 07:22 PM	Opacity	100	448	914	4.48
Mitchell 2		D1	12/23/22 07:22 PM	12/23/22 09:08 PM	Opacity	90	159	915	1.77
Mitchell 2		D1	12/23/22 09:08 PM	12/24/22 02:46 AM	Opacity	150	845	916	5.63
Mitchell 2		D1	12/24/22 02:46 AM	12/24/22 04:41 AM	Opacity	90	173	917	1.92
Mitchell 2		D1	12/24/22 04:41 AM	12/24/22 02:08 PM	Opacity	75	709	918	9.45
Mitchell 2		D1	12/24/22 06:48 AM	12/24/22 07:08 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	415	138	911	0.33
Mitchell 2		D1	12/24/22 07:08 AM	12/24/22 12:00 PM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	210	1,023	912	4.87
Mitchell 2		D1	12/24/22 02:08 PM	12/25/22 12:00 AM	Opacity	90	888	919	9.87
Mitchell 2		D3	12/25/22 12:00 AM	12/26/22 12:00 AM	Anticipated opacity	190	4,565	920	24.00
Mitchell 2		D3	12/26/22 12:00 AM	12/27/22 12:38 PM	Opacity	190	6,968	921	36.63
Mitchell 2		D3	12/27/22 12:38 PM	12/27/22 02:02 PM	Opacity	210	294	923	1.40
Mitchell 2		D3	12/27/22 02:02 PM	12/27/22 03:12 PM	Opacity	230	268	924	1.17
Mitchell 2		D3	12/27/22 03:12 PM	12/27/22 04:08 PM	Opacity	340	317	925	0.93
Mitchell 2		D3	12/27/22 04:08 PM	12/28/22 11:40 PM	Opacity	365	2,871	926	7.85

Event Type *
Outages
FO Forced Outage
MO Maintenance Outage
PO Planned Outage
RS Reserve Shutdown
SF Startup Failure
Note: i/r = inspection and repair
Curtailment
D1 Requires immediate reduction in capacity
D2 Does not require an immediate reduction in capacity but requires a reduction within six (6) hours
D3 Can be postponed beyond six (6) hours, but requires reduction in capacity before the end of the next weekend

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Unit Name	Event Type *	Event Start	Event End	Event Description
Big Sandy 1	PO	09/09/22 11:00 PM	01/14/23 11:47 AM	Boiler i/r, Generator Field Out inspection/possible rewedge, Turbine Valve i/r, Corrosion Fatigue i/r, Cooling Tower i/r, ReHeat Attemperator i/r, Gas valve i/r, FD Fan and Motor i/r, High Energy Piping (HEP) i/r, Flow Accelerated Corrosion (FAC) i/r, Core Loop testing.
Mitchell 1	PO	10/07/22 11:00 PM	11/19/22 05:32 PM	Boiler i/r, Precip i/r, Pulverizer/Feeder MATS i/r, Economizer wash, Replace Precip Transformer power cables, Replace SCR XJ s 14,15 and 115, Replace Exit Duct XJ FGX-71009, Water Cannon upgrades, Ovation Evergreen upgrade, Inter-lock testing, HE Piping i/r.
Mitchell 1	RS	11/19/22 05:32 PM	11/29/22 11:45 AM	Reserve Shutdown
Mitchell 1	SF	11/29/22 11:45 AM	11/29/22 06:03 PM	Unable to get firing permissives.
Mitchell 1	MO	12/03/22 01:47 AM	12/08/22 09:18 AM	Economizer tube leak repair
Mitchell 1	FO	12/08/22 11:45 AM	12/09/22 12:00 AM	PH Issues
Mitchell 1	FO	12/09/22 12:00 AM	12/10/22 08:01 AM	due to Urea from Hydrolyzer system entering the Condensate Return System. Samples will be collected and tested once the unit cools. Hydrolyzer will need pressurized to search for potential leaks.
Mitchell 1	FO	12/10/22 01:07 PM	12/13/22 04:30 PM	Due to Primary Superheater Outlet valve . packing blew out. Superheater Bypass Control valve URV 4, controller failed closed due to burned up controller.
Mitchell 1	RS	12/13/22 04:30 PM	12/14/22 02:45 AM	Reserve Shutdown
Mitchell 1	SF	12/14/22 02:45 AM	12/14/22 07:15 PM	Start Failure
Mitchell 1	MO	12/30/22 12:00 AM	01/22/23 05:59 PM	Boiler i/r, Boiler Hydro, Duct repairs, Clinker Removal, IK Soot Blower Repairs, 12 ID Fan Stall margin probe i/r.
Mitchell 2	PO	09/09/22 11:00 PM	12/16/22 02:25 PM	Boiler i/r, Cooling Tower i/r, Low Pressure Turbine "A"&"B" Valve replacement, SCR Catalyst #4 layer replacement, AH Basket i/r, Precip i/r.
Mitchell 2	PO	12/16/22 02:52 PM	12/16/22 03:28 PM	Boiler i/r, Cooling Tower i/r, Low Pressure Turbine "A"&"B" Valve replacement, SCR Catalyst #4 layer replacement, AH Basket i/r, Precip i/r.
Mitchell 2	FO	12/17/22 02:12 PM	12/20/22 04:08 PM	A Bus Relay PA Fan

Event Type *

FO	Forced Outage
MO	Maintenance Outage
PO	Planned Outage
RS	Reserve Shutdown
SF	Startup Failure
Note:	i/r = inspection and repair

VERIFICATION

The undersigned, Timothy C. Kerns, being duly sworn, deposes and says he is the Vice President of Generating Assets, for Appalachian Power Company and Wheeling Power Company, that he has personal knowledge of the matters set forth in the foregoing testimony and the information contained therein is true and correct to the best of his information, knowledge, and belief..

Timothy C Kerns

Timothy C. Kerns

Commonwealth of Kentucky	)	
	)	Case No. 2023-00159
County of Boyd	)	

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Timothy C. Kerns, on December 4, 2023.

Scott E. Bishop

Notary Public

SCOTT E. BISHOP
Notary Public
Commonwealth of Kentucky
Commission Number KYNP32110
My Commission Expires Jun 24, 2025

My Commission Expires June 24, 2025

Notary ID Number KYNP 32110

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application Of Kentucky Power Company For (1) A General Adjustment Of Its Rates For Electric Service; (2) Approval Of Tariffs And Riders; (3) Approval Of Accounting Practices To Establish Regulatory Assets And Liabilities; (4) A Securitization Financing Order; And (5) All Other Required Approvals And Relief	)))))))	Case No. 2023-00159

DIRECT TESTIMONY OF

TIMOTHY C. KERNS

ON BEHALF OF KENTUCKY POWER COMPANY

DIRECT TESTIMONY OF
TIMOTHY C. KERNS ON BEHALF OF
KENTUCKY POWER COMPANY
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

CASE NO. 2023-00159

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**DIRECT TESTIMONY OF
TIMOTHY C. KERNS ON BEHALF OF
KENTUCKY POWER COMPANY
BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY**

CASE NO. 2023-00159

I. INTRODUCTION

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

A. My name is Timothy C. Kerns. My business address is 200 Association Drive, Charleston, WV, 25311. In March 2023, I accepted the position of Vice President of Generating Assets for Appalachian Power Company ("Appalachian Power") and Wheeling Power Company ("Wheeling Power") effective April 2023. Appalachian Power and Wheeling Power are wholly owned subsidiaries of American Electric Power Company, Inc. ("AEP"). Immediately prior to my current role, I was Vice President of Generating Assets for Kentucky Power Company ("Kentucky Power" or "the Company") and Indiana Michigan Power Company ("I&M") from 2020 to 2023.

II. BACKGROUND

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science in Mechanical Engineering Degree from West Virginia Institute of Technology and have been employed by AEP system companies for 34 years. I have worked at various power plants across the AEP System since 1989 in various positions including as a Performance Engineer, a

Maintenance Engineer, and a Plant Manager where, among other things, I performed, directed, and managed outage and non-outage maintenance and capital work. Specifically, from 1989 to 1996 I was a Performance, Maintenance and Environmental Engineer at the Philip Sporn Plant; from 1996-1998 I was an Equipment Troubleshooting Specialist for the Regional Services Organization ("RSO"); from 1998-1999 I was a Zone Superintendent for the RSO; from 1999-2000 I was a Regional Engineer Manager; from 2001 to 2006 I was the RSO Manager; from 2006-2011 I was the Plant Manager at the Tanners Creek and Lawrenceburg Plants; from 2011 to 2017 I was the Plant Manager at the Rockport Plant; from 2017 to 2020 I was the Managing Director of Generating Assets for I&M; and from 2020 to 2023 I was the Vice President of Generating Assets for Kentucky Power, Wheeling Power and I&M.

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS VICE PRESIDENT GENERATING ASSETS FOR APPALACHIAN POWER AND WHEELING POWER.

A. In my new role I am responsible for the safe, reliable, and economic operation of the fossil-fueled generating assets owned and operated by the Companies. This includes the Amos, Mitchell, and Mountaineer coal-fired power plants, as well as the gas-fired Ceredo (simple-cycle combustion turbines), Clinch River (gas-fired boiler), and Dresden (combined-cycle) power plants, and Appalachian Power's hydro facilities. Specifically, I plan, organize, coordinate, direct, and control plant activities, including the operations, maintenance, engineering, and construction of the plant facilities. I also oversee plant budgets and interface with other AEP functional groups such as Accounting, Regulatory, and Commercial Operations to ensure the needs of the generating plants are met. Additionally, I am responsible for any decommissioning, demolition, and disposition of generating assets owned or operated by the Companies.

Q. PLEASE EXPLAIN YOUR FAMILIARITY WITH KENTUCKY POWER GENERATING ASSETS.

A. In my former role as Kentucky Power's Vice President of Generating Assets, I was responsible for the safe and reliable operation of Big Sandy Unit 1 and Mitchell Units 1 and 2 for over three years. More importantly, I was in the role throughout the test year for this proceeding.

Prior to the adoption of the resolutions identified in the Written Consent Action of the Mitchell Operating Committee, Kentucky Power was Mitchell Plant's operator until September 1, 2022. Until that time, I also had overall responsibility for the operation and maintenance of the Plant as the Company's Vice President of Generating Assets. I continue to have these responsibilities in my current role on behalf of Wheeling Power now that Wheeling Power is the operator for the Mitchell Plant. I am familiar with the day to-day operation of the Mitchell Plant as a result of my responsibilities in the oversight of Plant personnel in connection with the safe, reliable, and economic operation of the Plant. In this regard, my responsibilities include interacting on a regular basis with the Mitchell Plant manager, who reports directly to me, as well as with other Plant personnel in connection with both day-to-day and longer-term Plant activities. In addition, I regularly review budgets, review investments, and help plan the safe and reliable operation of that facility. I also continue to participate as a non-voting member of Mitchell Plant Operating Committee.

Lastly, as part of Wheeling Power's management team, I work in close coordination with the American Electric Power Service Corporation ("AEPSC") and Kentucky Power's Managing Director of Generating Assets to ensure the Mitchell Plant is safe, reliable and provides benefit to customers through effective management of O&M expenditures and capital investments.

Q. HAVE YOU PREVIOUSLY TESTIFIED IN ANY REGULATORY PROCEEDINGS?

A. Yes. I have submitted testimony and testified on behalf of Kentucky Power before this Commission in Case Nos. 2020-00174 (2020 base rate case) and 2021-00421 (Mitchell Plant operating agreements). I have also submitted testimony on behalf of Wheeling Power before the West Virginia Public Service Commission ("WVPSC") in Case No. 21-0810-E-PC. In addition, I have submitted testimony and testified on behalf of I&M before the Indiana Utility Regulatory Commission in Cause Nos. 44967, 44511, and 45235, and the Michigan Public Service Commission in Cause Nos. U-18370, U-20070, and U-20359. Finally, I submitted testimony at the Federal Energy Regulatory Commission in AEP Generating Company's depreciation rate cases.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to:

- Describe Kentucky Power's generation assets;

- Describe and support the reasonableness of Kentucky Power's generation non-fuel, non-labor operation and maintenance ("O&M") expenses for the Mitchell and Big Sandy Plants;
- Describe the retired Big Sandy generating assets;
- Describe capital investments placed in-service at Kentucky Power's generating assets since the Company's last base case; and
- Describe the performance of the Company's generation fleet during Winter Storm Elliott.

Q. WHAT IS THE TEST YEAR FOR THIS PROCEEDING?

A. The test year in this proceeding is the twelve-month period from April 1, 2022 through March 31, 2023.

Q. ARE YOU SPONSORING ANY EXHIBITS AS PART OF YOUR TESTIMONY?

A. Yes. I am sponsoring the following exhibits attached to my testimony:

EXHIBIT	DESCRIPTION
Exhibit TCK-1	Company's Response to Commission's Staff Set 1, Question 6 In Case No. 2023-00145

IV. KENTUCKY POWER'S GENERATING ASSETS

Q. PLEASE DESCRIBE KENTUCKY POWER'S GENERATION ASSETS.

A. Kentucky Power's generation assets consisted of both owned and contracted generation capacity totaling 1,468 MW until December 7, 2022. Beginning December 7, 2022 through the 2022/2023 PJM planning year ending May 31, 2023, Kentucky Power's owned and contracted generation capacity totaled approximately 1,227 MW under the terms and conditions of the Power Coordination Agreement ("PCA").

Q. PLEASE BRIEFLY DESCRIBE KENTUCKY POWER'S OWNED GENERATION.

A. Kentucky Power's generation assets consist of a total of 1,075 MW of capacity from two generating plants, Big Sandy and Mitchell. The Company's assets and their characteristics are listed in Figure TCK-1.

Figure TCK-1: Kentucky Power Generation Assets

Plant	Kentucky Power-Owned Capacity (MW)	No. of Units	Location	Fuel	Expected Retirement Date
Big Sandy	295	1	Louisa, KY	Natural Gas	2031
Mitchell	780	2	Moundsville, WV	Coal	2040

Kentucky Power owns and operates the Big Sandy Plant located near Louisa, Kentucky. The plant currently has a single operating unit with a generating capacity of 295 MW. Big Sandy Unit 1 was originally placed in service in 1963 and operated as a 278 MW sub-critical coal-fired generating unit through mid-November 2015. As approved by the Commission in Case No. 2013-00430, and described later in my testimony, Big Sandy Unit 1 was converted to a natural gas-fired unit and returned to service May 31, 2016. The Unit is equipped with low nitrogen oxide ("NO_x") burners with overfire air for reduction of NO_x emissions.

The Mitchell Plant is located approximately 12 miles south of Moundsville, West Virginia on the Ohio River. Kentucky Power owns an undivided 50% interest in the Mitchell Plant; the other 50% interest is owned, and operated, by Wheeling Power. The plant comprises two super-critical pulverized coal-fired baseload generating units. Mitchell Unit 1 has a capacity of 770 MW and Mitchell Unit 2 has a capacity of 790 MW for a total capacity of 1,560 MW. Both Units were placed in service in 1971.

Q. PLEASE DESCRIBE WHAT COMPRISES KENTUCKY POWER'S CONTRACTED GENERATION.

A. Kentucky Power was a party to a unit power agreement ("UPA") with AEP Generating Company for power from the Rockport Plant that terminated December 7, 2022. The Rockport Plant is located along the Ohio River in southern Indiana and consists of two supercritical pulverized coal-fired generating units. Kentucky Power's contractual share of the Rockport output totaled 393 MW. Upon termination of the Rockport UPA, the Company forecasted that it would require 152.4 MW of replacement capacity through the 2022/2023 PJM planning year ending May 31, 2023 that would be obtained through the PCA between Kentucky Power and AEP's Operating Companies.

Q. HAVE THE RETIREMENT DATES FOR BIG SANDY UNIT 1 OR MITCHELL GENERATING UNITS CHANGED?

A. There have been no changes to the expected retirement dates of either Big Sandy Unit 1 or the Mitchell Plant. With continued investment and maintenance, Big Sandy Unit 1 is expected to reach its current retirement date of 2031 and the Mitchell plant is expected to reach its retirement date of 2040. However, it is my understanding that, based on its recently filed Integrated Resource Plan, the Company is proposing to operate Big Sandy Unit 1 through 2041. Additionally, as a result of the Commission's Order in Case No. 2021-00004 denying a Certificate for Public Convenience and Necessity ("CPCN") for Effluent Limitation

Guidelines ("ELG") projects at Mitchell Plant, Kentucky Power's interest in Mitchell will terminate in 2028.

Q. PLEASE DESCRIBE THE KENTUCKY POWER GENERATING ASSETS THAT HAVE BEEN RETIRED.

A. Due to EPA's Mercury and Air Toxics ("MATS") Rule, Big Sandy Unit 2, an 800MW coal-fired generating asset, was retired in May 2015 and Big Sandy Unit 1 was converted from coal-fired to natural gas-fired in May 2016. The fuel conversion allowed Big Sandy Unit 1 to continue to operate in compliance with the stringent air emission requirements of MATS. There were coal-related assets for Big Sandy Unit 1 that were retired since they were not required for its natural gas operations.

Demolition activities at Big Sandy Unit 2 began in 2016. Since that time, the dismantlement of coal handling equipment and the demolition of its cooling tower, turbine building, boiler house, and environmental equipment have been completed. Currently, fly ash pond post-closure monitoring activities and asbestos abatement continue at the Big Sandy Plant. The going-forward coal-related decommissioning ARO costs associated with the fly ash pond and asbestos abatement for Big Sandy Unit 2 are identified by Company Witness Whitney.

Big Sandy Unit 1, although converted to a natural gas generating asset in 2016, had some equipment solely related to its operation as a coal-fired facility. Examples of Big Sandy Unit 1's coal-related assets included the coal yard and its associated equipment, the conveyors and silos which transferred coal from the coal yard to the plant, the coal pulverizers, the Electrostatic Precipitators ("ESP"), and the fly ash and bottom ash handling systems. This equipment was no longer necessary when the unit began operating as a natural gas unit and was retired once the unit no longer operated as a coal-fired facility.

V. KENTUCKY POWER GENERATION O&M

Q. WHAT ARE THE O&M REQUIREMENTS OF KENTUCKY POWER'S GENERATION ASSETS?

A. Kentucky Power's plants must provide safe, economical, and reliable generation output to serve load and accommodate fluctuating customer needs. In addition, a unit's maintenance needs vary based on its type, design, age, condition, and operational characteristics. All units are maintained to maximize operations, and to do so in a safe manner in compliance with all local, state, and federal regulations.

Q. HOW ARE O&M COSTS CONTROLLED AT THE PLANTS?

A. To minimize O&M expenses, Kentucky Power relies on a system of maintenance and operations management programs to ensure optimal performance of the generating assets. These maintenance programs are:

- Predictive Maintenance: monitoring, inspections, and/or data analyses conducted to diagnose potential maintenance issues early and usually while the equipment is running to minimize downtime.
- Preventive Maintenance: protocols, testing, and physical work conducted on equipment to address anticipated or diagnosed vulnerabilities.

In addition, continuous improvements are incorporated into the operations and maintenance of the generating units to eliminate waste and increase process efficiencies. Together, these maintenance and operations management programs help to optimize operation of the assets and limit O&M cost escalations.

Q. WHAT IS KENTUCKY POWER'S TEST YEAR LEVEL OF GENERATION O&M EXPENSE?

A. Kentucky Power's non-fuel, non-consumables, non-labor test year Generation O&M expense is $27.634 million. As shown in Figure TCK-2 below, Kentucky Power's test year Generation O&M expenses include steam maintenance and steam operations amounts for Big Sandy, the Company's 50% undivided interest in Mitchell, and shared plant costs not attributable to a specific generating unit (known as Non-Plant costs).

TCK-2: Test Year Kentucky Power Non-Fuel, Non-Consumables, Non-Labor Test Year Generation O&M*

Category	Big Sandy Plant	Mitchell Plant	Non-Plant	Total
Steam Maintenance	$5,954,613	$12,408,247	$212,067	$18,522,160
Steam Operations	$1,570,122	$4,911,699	$2,629,917	$9,111,737
Total:	$7,524,734	$17,319,946	$2,841,984	$27,633,897

*Total may not sum due to rounding

Q. DOES THE TOTAL AMOUNT OF $27.634 MILLION REPRESENT AN APPROPRIATE AND REASONABLE ONGOING LEVEL FOR O&M FOR KENTUCKY POWER'S GENERATION ASSETS?

A. Yes. This total level is reasonable and fairly reflects an appropriate level of O&M for Big Sandy and Kentucky Power's undivided 50% share of the Mitchell Plant.

VI. GENERATION CAPITAL ADDITIONS

Q. PLEASE PROVIDE AN OVERVIEW OF GENERATION CAPITAL ADDITIONS PLACED IN-SERVICE SINCE THE COMPANY'S LAST BASE CASE.

A. As shown in TCK-3 below, Kentucky Power had steam and other generation plant related capital additions totaling approximately $44.167 million placed in-service since the Company's last base case. Of that amount, $11.221 million is associated with major fossil fuel generation capital projects and $22.529 million that is associated with Production Plant Blanket ("PPB") capital projects.

Allocations to Kentucky Power's fossil fuel generation organization for intangible projects (information technology projects that are not associated with physical capital additions at Kentucky Power's plants but provide benefits to Kentucky Power) account for a combined total of approximately $11.551 million. General capital additions that support plant operations account for approximately $456 thousand. The remaining fossil fuel generation capital amounts include Asset Retirement Obligation ("ARO") estimates that resulted in a reduction of approximately $1.590 million to capital additions.

Figure TCK-3 is inclusive of all environmental project capital additions placed in-service since the last base case. However, all environmental project costs associated with ESP, Selective Catalytic Converter Reduction ("SCR"), and Dry Sorbent Injection ("DSI") capital additions are collected through Environmental Compliance Plan ("ECP") Company filings as discussed by Company Witness Kahn.

Figure TCK-3: Generation Capital Additions
April 2020 – March 2023

Plant	Project Description	Addition to Plant ($)
Big Sandy Plant	**Fossil Fuel Major Projects**	
	(Non-Environmental)	
	North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) Physical Security Upgrade	$519,594
		$519,594
	(Environmental)	
	Repurpose Big Sandy Bottom Ash Pond (BAP)	$417,077
		$417,077
	Big Sandy Fossil Fuel Major Projects Sub-Total:	**$936,672**
	Other Fossil Generation Capital Projects	
	Production Plant Blanket Projects:	$5,811,279
	Non-Environmental	$5,808,906
	Environmental	$2,373
	ARO	$2,752,924
	Big Sandy Other Fossil Generation Capital Projects Sub-Total:	**$8,564,203**
Big Sandy Plant Total		**$9,500,875**
Mitchell Plant (Kentucky Power Share)	**Fossil Fuel Major Projects**	
	(Non-Environmental)	
	Mitchell Unit 2 Cooling Tower Components Replacement	$2,772,398
	Mitchell Unit 2 Air Heater Basket Replacement	$2,077,824
	Mitchell Unit 1 - Phase 2 Generator Step-up (GSU) Transformer Replacement	$13,416
		$4,863,638
	(Environmental)	
	Mitchell Unit 2 Electrostatic Precipitator (ESP)Upgrades	$2,115,185
	Mitchell Unit 1 Selective Catalytic Converter (SCR) Catalyst Layer 4 Replacement	$1,357,439
	Mitchell Unit 0 Dry Sorbent Injection (DSI) Lime Conversion	$1,326,811
	Mitchell Landfill Expansion -Phase 3	$587,858
	Mitchell Unit 1 SCR Catalyst Layer 3 Replacement	$27,976
	Mitchell Unit 2 - SCR Catalyst Layer 3 Replacement	$5,483
		$5,420,752
	Mitchell Fossil Generation Capital Projects Sub-Total:	**$10,284,390**
	Other Fossil Generation Capital Projects	
	Production Plant Blanket Projects	$16,718,190
	Non-Environmental	$13,365,463
	Environmental	$3,352,727
	ARO	($4,343,418)
	Mitchell Other Fossil Generation Capital Projects Sub-Total:	**$12,374,772**
Mitchell Plant Total		**$22,659,162**
Various Facilities	Intangible Capital Projects	$11,551,194
	General Capital Projects	$456,050
Various Facilities Total		**$12,007,244**
Total Kentucky Power Capital Additions		**$44,167,280**

Q. PLEASE SUMMARIZE INDIVIDUAL MAJOR FOSSIL FUEL GENERATION CAPITAL PROJECT ADDITIONS OVER $1 MILLION INCLUDED IN FIGURE TCK-3 AND EXPLAIN WHY THEY WERE NECESSARY.

A. A summary of individual major fossil fuel generation capital project additions over $1 million reflected in TCK-3 and associated necessities are summarized below.

Mitchell Major Capital Projects

Non-Environmental

- Mitchell Unit 2 Cooling Tower Components – Some of the Cooling Tower components had reached the end of their useful life after 30 years of service and some components had deteriorated to a point where they would not last another 5-years without failing. This project replaced the Hot Water Distribution deck, louvers and louver columns, outer periphery longitudinal girts, and other associated components.
- Mitchell Unit 2 Air Heater Basket Replacement –The air heater baskets were one year beyond their typical life cycle and were beginning to deteriorate exponentially. As a result, Mitchell Unit 2 was beginning to experience increases in its equivalent forced outage rate ("EFOR") associated with the baskets. The existing air heater baskets have been replaced with new air heater baskets.

Environmental

- Mitchell Unit 2 ESP Upgrades – Upgrades required to comply with particulate matter emission limits and the state of West Virginia 10% opacity limit. The scope of the project included:
  - the installation of a new heated purge air system;
  - repair and replacement of corroded ESP sidewall casing, hopper casing, and ductwork as needed;
  - removal and replacement of the hot and cold roof, including insulation, for approximately half of the precipitator;
  - replacement of the discharge electrode support insulators as needed;
  - repair of the collecting and discharge electrode rapper system; and
  - replacement of the hopper level detection system.
- Mitchell Unit 1 SCR Catalyst Layer 4 Replacement – 4th layer SCR catalyst replacement was required to maintain desirable NOx removal effectiveness. NOx emissions are subject to the New Source Review ("NSR") Consent

Decree and Cross-State Air Pollution Rule ("CSAPR"). The catalyst layer replacement will also maintain effective mercury oxidation across the SCR catalyst reactor.

- Mitchell Units 0 DSI Lime Conversion Project – Mitchell Plant currently uses Trona for SO_3 mitigation. The project reconfigured the existing DSI system for Mitchell Units 1 and 2 to more efficiently handle hydrated lime in lieu of Trona, and reduce issues related to corrosion, as well as gain benefits such as heat rate improvement, improved Equivalent Unplanned Outage Rate ("EUOR"), and a lower minimum load. Conversion to lime also allows for the use of a higher percentage of high sulfur coal which has historically been cheaper than the lower sulfur coal, thereby resulting in lower overall fuel costs. The project also installed a new distributed control system for the DSI.

Q. WHAT ARE PPB PROJECTS?

A. PPB projects are capital projects necessary to provide for the safe, environmentally responsible, reliable, and efficient operation of our generating units. They are sometimes referred to as 'Maintenance Capital' projects. These projects are placed into two categories, major or minor. Major plant blanket projects will have a total cost of over $1,000,000, but under $3,000,000. Minor plant blanket projects, the vast majority of which are smaller component replacements and installations, are projects that have a total cost of under $1,000,000.

When evaluating these PPB projects, Kentucky Power looks for cost savings whenever possible without jeopardizing reliability and safety. All PPB projects over $1 million are also reviewed and approved through AEPSC's Strategic Capital Prioritization Process ("SCPP") which includes review and approval by AEP's Vice President (VP) of Project Solutions, VP of Engineering

Service, VP of Generation Shared Services, VP of Appalachian Power Company/ Wheeling Power Company Generating Assets, and VP of Southwestern Power Company Generating Assets.

Q. PLEASE DESCRIBE SOME OF THE PPB CAPITAL ADDITIONS OVER $1 MILLION SINCE THE LAST BASE CASE AT KENTUCKY POWER PLANTS.

A. The major PPB projects for the Big Sandy and Mitchell Plants are listed below:

Big Sandy Major PPB Capital Projects

- Big Sandy Unit 1 Generator Stator Re-wedge – The generator stator was last re-wedged in 2008 and upon inspection in fall 2022, it was determined the stator required another re-wedge in order to mitigate the potential risk of a premature stator failure and thereby enhance the reliability of the generator. A stator failure would have left the Unit in a forced state of being unable to operate for a period of one year or more due to long lead time materials.

Mitchell Plant Major PPB Capital Projects

- Mitchell Unit 2 SCR Catalyst Layer 4 Replacement – Need for the replacement of the catalyst 4th layer was due to normal deactivation over thousands of hours of run time. SCR NOx removal effectiveness requires adequate activity levels. SCR NOx performance is required for compliance with the NSR Consent Decree requirements and CSAPR regulations.

Q. PLEASE SUMMARIZE THE INTANGIBLE CAPITAL INVESTMENTS

A. Intangible capital projects are routine software updates and new programs that increase the efficiency of Kentucky Power's Generation organization.

Q. ARE EXPENSES RELATED TO ELG COMPLIANCE AT MITCHELL INCLUDED UNDER PPB PROJECTS OR INCLUDED IN O&M EXPENSES?

A. No. As I stated earlier in my testimony, this Commission did not approve the CPCN to execute ELG projects required by EPA to comply with its revisions to the ELG rule effective October 2020 at the Mitchell Units; therefore, Kentucky Power is not authorized to recover costs related to ELG compliance projects at Mitchell.

Q. HOW DOES THE COMPANY ENSURE ELG-RELATED COSTS ARE NOT CHARGED TO KENTUCKY POWER SINCE THIS COMMISSION ONLY APPROVED COAL COMBUSTION RESIDUALS ("CCR") PROJECT UPGRADES?

A. Pursuant to the September 1, 2022 Written Consent Action of the Mitchell Operating Committee, which is included as Exhibit V of Section II of the Company's Application, the Company hired Burns & McDonnell, an independent engineering, architecture construction, environmental consulting firm, to perform an assessment of the scope of work directly related to the CCR and ELG projects for the purpose of determining the appropriate allocation of CCR and ELG related costs. As a result of and in accordance with Burns & McDonnell's assessments, the Company established work orders to ensure costs related to the scope of work for each of the CCR and ELG projects are appropriately charged.

VII. GENERATION PERFORMANCE DURING WINTER STORM ELLIOTT

Q. PLEASE DESCRIBE WINTER STORM ELLIOTT.

A. As explained further by Company Witness Vaughan, Winter Storm Elliott was a bomb cyclone[1] that impacted the PJM region from December 23, 2022 through December 27, 2022 (the "Winter Storm Elliott Period"), causing extreme cold weather, including blizzards, high winds, and snow.

Q. WERE THE COMPANY'S GENERATION ASSETS AVAILABLE AND OPERATING DURING THE WINTER STORM ELLIOTT PERIOD?

A. Both Mitchell Unit 1 and Unit 2 (collectively, the "Mitchell Units") were available and operating throughout the Winter Storm Elliott Period. As shown in Exhibit TCK-1, Mitchell Unit 1 had a Net Capacity Factor[2] ("NCF") of 80.3% and Mitchell Unit 2 had an NCF of 74.1% during the Winter Storm Elliott Period. Big Sandy Unit 1 was in a Planned Outage and was unavailable.

Q. HOW DOES THE MITCHELL PLANT PREPARE FOR WINTER?

A. In preparation for winter, the Mitchell Plant implements a "Winter Preparedness Plan." In 2022, the plant implemented the "Winter Preparedness Plan" starting on October 3, 2022. The standard plan included employee training, completing preventative maintenance work orders, performing equipment checks, replenishing supplies, and other winter preparedness activities. Plant personnel completed a cold weather site specific plan review on October 19, 2022 and completed training on the North American Electric Reliability Council cold weather reliability standards

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[1] A bomb cyclone is a large, intense storm that rapidly intensifies and is defined by a sudden and significant drop in atmospheric pressure.

[2] Net Capacity Factor is defined as the ratio of the generating unit's ((net actual generation) to its net maximum capacity for the number of hours in the period being reported that the unit was in the active state) x 100%.

by October 31, 2022. Cold Weather Preparedness and Winterization checks conducted as preventative maintenance activities were completed by November 2, 2022.

Q. DID THE MITCHELL PLANT TAKE ANY ADDITIONAL PREPARATORY STEPS IN ADVANCE OF WINTER STORM ELLIOTT?

A. Yes. In anticipation of Winter Storm Elliott, Mitchell Plant staffing was increased to at least one on-site member from the plant leadership team and additional plant operations personnel and contractor support were brought on site.

Q. HOW DID THE MITCHELL UNITS PERFORM DURING WINTER STORM ELLIOTT?

A. Both Mitchell Units performed well during the Winter Storm Elliott Period. Both Units had a 0% forced outage factor[3] and 0% maintenance outage factor[4], meaning at no point during the event were either of the Mitchell Units unavailable.

Q. WAS EITHER UNIT'S OUTPUT REDUCED (OR DERATED) DURING WINTER STORM ELLIOTT?

A. Yes, at times, both Mitchell Units experienced derates due to operational issues. A "derate" is defined as a decrease in the available capacity of an electric generating unit, commonly due to a system or equipment modification or environmental, operational, or reliability considerations. As demonstrated in Exhibit TCK-1, a significant portion of the derates experienced at both Mitchell Units were required to comply with particulate matter emission limits and the state of West Virginia's

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[3] Forced outage factor is the ratio of ((All hours experienced during forced outages) to the number of hours in the period being reported that the unit was in the active state) x 100%.

[4] Maintenance outage factor is the ratio of ((All hours experienced during maintenance outages) to the number of hours in the period being reported that the unit was in the active state) x 100%.

10% opacity limit. The opacity-related derates were not driven by Winter Storm Elliott. Mitchell Unit 1 also had a small 35 MW derate related to a boiler clinker for the duration of the Winter Storm Elliott Period.

The remaining derates were caused by frozen coal causing the coal conveyor to trip out, freezing of slurry feed tanks, and a pulverizer damper operation issue. This group of derates lasted a combined total of only 20.31 of the 240 hours of operation between both Mitchell Units during the Winter Storm Elliott Period.

During Winter Storm Elliott, Unit 1 had an equivalent availability factor[5] ("EAF") of 86.3%, and Unit 2 had an EAF of 78.4%.

Q. HOW DOES THE MITCHELL PLANT'S PERFORMANCE DURING WINTER STORM ELLIOTT COMPARE TO ITS HISTORICAL PERFORMANCE?

A. Both Mitchell Units performed favorably during Winter Storm Elliott as compared to their historic performance, as Figure TCK-4 demonstrates.

[5] Equivalent Availability factor is the ratio of ((Available hours – equivalent planned derated hours – equivalent unplanned derated hours – equivalent seasonal derated hours) to the number of hours in the period being reported that the unit was in the active state) x 100%.

**Figure TCK-4: Mitchell Unit Performance:
Winter Storm Elliott Period Compared to 2016-2021**

Mitchell Unit	Winter Storm Elliott Period Net Capacity Factor ("NCF")	Average NCF (2016-2021)	Highest NCF (2016-2021)	Winter Storm Elliott Period Average Availability Factor ("EAF")	Average EAF (2016-2021)	Highest EAF (2016-2021)
Unit 1	80.3%	36.9%	52.%	86.3%	57.1%	68.1%
Unit 2	74.1%	46.6%	65.8%	78.4%	69.3%	84.4%

As demonstrated above, Unit 1's NCF and EAF and Unit 2's NCF during the Winter Storm Elliott Period were higher during Winter Storm Elliott that their 6-year highest annual levels. Both Units' NCF and EAF during the storm period far exceeded their 6-year averages.

Q. COULD THE COMPANY REASONABLY HAVE DONE ANYTHING DURING THE WINTER STORM ELLIOTT PERIOD TO INCREASE THE OUTPUT OF THE MITCHELL GENERATING FACILITIES?

A. No. Again, it is important to reiterate that, although the Mitchell Units were derated during Winter Storm Elliott, at no point was either Mitchell Unit unavailable to serve customers. Furthermore, the Company cannot legally operate the Mitchell Units in a manner that would violate the particulate matter emission limits and the state of West Virginia's 10% opacity limit. The remaining non-opacity related derates were short in duration but were required to allow for the necessary repairs to be made while keeping the Units available. As such, when both Mitchell Units were needed during this extreme event, they were available and performed well, to the benefit of Kentucky Power customers.

Q. PLEASE DESCRIBE THE PLANNED OUTAGE AT BIG SANDY DURING WINTER STORM ELLIOTT.

A. Big Sandy Unit 1 began a Planned Outage on September 10, 2022. The outage was originally scheduled to be completed on December 4, 2022, but had to be extended several times through January 14, 2023 for a number of reasons including additional time required to repair the generator due to hot spots in the core, replacement of the generator rotor collector end retaining ring due to a crack discovered during the outage, the repair of the hydrogen seal housing at the exciter due to a leak, and the need to repair an unexpected condenser leak identified at start-up. The extensions to the outage were necessary to repair and/or replace generator components to prevent the risk of a catastrophic failure of the generator as well repair the condenser to allow the Unit to restart and avoid future forced outages. The timeline for the Company's outage extension request to PJM is discussed later in my testimony. Each extension for the Big Sandy fall 2022 outage was approved by PJM.

Q. WHAT IS A PLANNED OUTAGE?

A. A Planned Outage is a generating unit outage of a predetermined duration that can last for several weeks and occurs only once or twice a year. Typically, these events consist of a known scope of work and duration that is estimated prior to the outage being scheduled.

Q. HOW ARE PLANNED OUTAGES SCHEDULED?

A. Planned Outages are scheduled well in advance (months and sometimes even years) due to significant scope, equipment lead time, engineering, and time out of operation. Such outages are planned in conjunction with PJM and with PJM's approval. The Company schedules Planned Outages during the shoulder months attempting to avoid, to the extent practical, multiple units simultaneously in a Planned Outage.

Q. WHEN A UNIT IS IN A PLANNED OUTAGE, IS IT POSSIBLE TO QUICKLY RETURN THE UNIT TO SERVICE IF MARKET CONDITIONS CHANGE?

A. Generally, it is not. During a Planned Outage, a generating unit is often at least partly dismantled, often with pressure parts (parts that contain steam at very high pressures and temperatures when operating, such as boilers, turbines, etc.) taken apart to be inspected, maintained, and/or replaced. It is very difficult if not impossible to safely and quickly return a unit to service or deviate from the work plan for the outage, particularly when major equipment is disconnected or dismantled for repair at that time.

Q. PLEASE DESCRIBE THE SCOPE OF WORK THAT WAS TO BE COMPLETED DURING THE PLANNED OUTAGE AT BIG SANDY UNIT 1.

A. As originally scoped, the fall 2022 Planned Outage at Big Sandy Unit 1 included a generator field out inspection and a possible re-wedge of the Unit's stator.[6] The Company was, in fact, required to completely re-wedge the stator as part of this scope of work.

[6] The stator is the stationary part of a rotary system found in electric generators. In an electric generator, the stator converts the rotating magnetic field to electric current.

Q. WHY DID BIG SANDY'S OUTAGE EXTEND BEYOND ITS PLANNED OUTAGE END DATE?

A. In November 2022, the Company extended the Planned Outage at Big Sandy Unit 1 to December 12, 2022, as it needed additional time to complete the original scope of work. Then, on November 13, 2022, the Company discovered a crack on the generator rotor collection end retaining ring and determined that the retaining ring required replacement prior to returning the Unit to service. In order to complete that repair, on December 2, 2022, the Company requested the Planned Outage at Big Sandy Unit 1 be extended through December 30, 2022. PJM approved the extension on December 2, 2022. The Planned Outage was extended twice more for a hydrogen seal leak identified during an air leakage test and a condenser leak discovered during start up. These extensions were requested on December 22, 2022, and January 10, 2023, and were approved by PJM on December 28, 2022, and January 11, 2023, respectively.

Q. COULD THE COMPANY HAVE PLACED BIG SANDY UNIT 1 IN SERVICE WITHOUT ADDRESSING THE ITEMS THAT CAUSED THE PLANNED OUTAGE TO BE EXTENDED THROUGH THE WINTER STORM ELLIOTT PERIOD?

A. No, it could not. First, as explained further above, extending the outage to replace the retaining ring extended the Planned Outage through what became the Winter Storm Elliott Period. If the Company had not replaced that retaining ring, Big Sandy Unit 1 would have been at an increased risk of catastrophic failure. Therefore, the Company could not have safely placed the Unit back in service and operated it without replacing the retaining ring. It likewise could not have put the Unit safely back in service without fixing the hydrogen seal and condenser leaks.

Q. **WAS THERE ANY WAY FOR THE COMPANY TO HAVE KNOWN ABOUT THE WINTER STORM ELLIOTT EVENT WHEN IT REQUESTED THE PLANNED OUTAGE EXTENSION ON DECEMBER 2, 2022.**

A. No.

Q. **WERE THE COMPANY'S ACTIONS RELATED TO EXTENDING THE BIG SANDY UNIT 1 OUTAGE REASONABLE?**

A. Yes. The Company could not have brought Big Sandy Unit 1 back online to serve customers during Winter Storm Elliott without risking a catastrophic failure of the Unit as all the repairs described above were required to be completed in order to safely operate the Plant. Therefore, it was reasonable to extend the planned outage to ensure the Unit would be in good working order to service customers into the future.

VIII. CONCLUSION

Q. **DOES THIS CONCLUDE YOUR TESTIMONY?**

A. Yes, it does.

DATA REQUEST

KPSC 1_6 Provide a detailed explanation of how Kentucky Power's generating units were operating during Winter Storm Elliott. Include in the response a list and event description in chronological order showing by unit and date any scheduled, actual, and forced outage for the months of November and December 2022.

RESPONSE

Winter Storm Elliott began in the Pacific Northwest on December 20, 2022 and moved east at a rapid pace becoming a bomb cyclone, an area of low pressure that intensifies rapidly, and entering the PJM territory on December 23, 2022. Winter Storm Elliott impacted the PJM territory from December 23, 2022 until December 27, 2022. During that period, none of the Company's generating units were forced from service.

Big Sandy Unit 1 was in its Planned Outage (9/9/22 – 1/14/23) which was extended from its planned end date of 12/12/2022 due to emergent generator repair work discovered during its reassembly. The completion of this work was required so the unit could be returned to service and operated safely and reliably.

Both Mitchell units operated continuously throughout the Winter Storm Elliott period (12/23/2022 – 12/27/2022). At times during that period, each of units' output was reduced (or derated) due to operational issues. Those deratings resulted in Net Capacity Factors (NCF) of 80.3% and 74.1% for Units 1 and 2, respectively and were largely unrelated to the extreme weather.

Table 1 below describes the performance of the Company's generating units during the period.

Table 1. KPCo Unit Performance During the 5 day Winter Storm Elliott Period (12/23/2022 - 12/27/2022)

	Equivalent Forced Outage Rate (EFOR)	Equivalent Availability Factor (EAF)	Net Capacity Factory (NCF)
Big Sandy Unit 1	0.0%	0.0%	0.0%
Mitchell Unit 1	13.7%	86.3%	80.3%
Mitchell unit 2	21.6%	78.4%	74.1%

Performance Metric Definitions
Equivalent Forced Outage Rate (EFOR)[1] - The ratio of unit's forced outage hours + derates to the its forced outage hours + service hours expressed as a percentage.
Equivalent Availability (EAF)[1] - The ratio of the unit's available hours - all derate hours to the number of hours in the period.
Net Capacity Factor (NCF)[1] - The ratio of the unit's net generation to it maximum potential output for the period.
[1] Formal definitions and equations for performance metrics can be found in the ***NERC 2023 Data Reporting Instructions - Appendix F***

Attachment KPCO_R_KPSC_1_6_Attachment1 lists the curtailing (derating) events for the period by unit and in chronological order.

Attachment KPCO_R_KPSC_1_6_Attachment2 lists the forced, maintenance and planned outages in chronological order for the months of November and December 2022.

Witness: Robert A. Jessee

KPSC Case No. 2023-00145
Commission Staff's First Set of Data Requests
Dated May 10, 2023
Item No. 6
Attachment 1
Page 1 of 1

	Event Type Code *								
Unit Name	Outages	Curtail.	Event Start	Event End	Event Description	MW Reduction	Period Elapsed Loss (MWH)	Event Number	Event Elapsed Time (Hours)
Big Sandy 1	PO		09/09/22 11:00 PM	01/14/23 11:47 AM	Boiler i/r, Generator Field Out inspection/possible rewedge, Turbine Valve i/r, Corrosion Fatigue i/r, Cooling Tower i/r, ReHeat Attemperator i/r, Gas valve i/r, FD Fan and Motor i/r, High Energy Piping (HEP) i/r, Flow Accelerated Corrosion (FAC) i/r, Core Loop testing.	295	35,448	71	119.98
Mitchell 1		D3	12/22/22 12:00 AM	12/30/22 12:00 AM	Large clinker growing on North side of Boiler	35	4,200	948	119.98
Mitchell 1		D1	12/24/22 06:48 AM	12/24/22 07:06 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	465	140	949	0.30
Mitchell 1		D1	12/24/22 07:06 AM	12/24/22 07:43 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	97	60	950	0.62
Mitchell 1		D1	12/24/22 07:43 AM	12/24/22 08:20 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	465	287	951	0.62
Mitchell 1		D1	12/24/22 08:20 AM	12/24/22 12:00 PM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	140	514	952	3.67
Mitchell 1		D1	12/24/22 01:48 PM	12/24/22 07:34 PM	Opacity	80	462	953	5.77
Mitchell 1		D1	12/24/22 07:34 PM	12/25/22 09:00 AM	Opacity	90	1,210	954	13.43
Mitchell 1		D1	12/25/22 10:07 AM	12/25/22 12:31 PM	Frozen lumps of coal causing conveyor trip out outs	135	324	955	2.40
Mitchell 1		D1	12/26/22 12:20 AM	12/26/22 08:29 AM	Opacity	45	368	956	8.15
Mitchell 1		D1	12/26/22 08:29 AM	12/26/22 08:46 AM	Opacity	60	17	957	0.28
Mitchell 1		D1	12/26/22 08:46 AM	12/27/22 12:00 AM	Opacity	85	1,296	958	15.23
Mitchell 1		D3	12/27/22 12:00 AM	12/27/22 01:40 AM	Opacity	85	142	959	1.67
Mitchell 1		D3	12/27/22 01:40 AM	12/27/22 02:02 AM	Opacity	135	50	960	0.37
Mitchell 1		D3	12/27/22 02:02 AM	12/27/22 02:53 AM	Opacity	155	132	961	0.85
Mitchell 1		D3	12/27/22 02:53 AM	12/27/22 04:43 AM	Opacity	185	339	962	1.83
Mitchell 1		D3	12/27/22 04:43 AM	12/27/22 07:22 AM	Opacity	205	544	963	2.65
Mitchell 1		D3	12/27/22 07:22 AM	12/27/22 11:03 AM	Opacity	235	866	964	3.68
Mitchell 1		D3	12/27/22 11:03 AM	12/28/22 12:00 AM	Opacity	245	3,174	965	12.93
Mitchell 2		D1	12/23/22 10:10 AM	12/23/22 10:28 AM	25 Pulv issue	95	29	908	0.30
Mitchell 2		D1	12/23/22 10:28 AM	12/23/22 05:44 PM	25 Pulv issue, could not get dampers to operate	90	654	910	7.27
Mitchell 2		D1	12/23/22 12:07 PM	12/23/22 01:56 PM	Opacity	25	46	909	1.82
Mitchell 2		D1	12/23/22 01:56 PM	12/23/22 02:53 PM	Opacity	50	48	913	0.95
Mitchell 2		D1	12/23/22 02:53 PM	12/23/22 07:22 PM	Opacity	100	448	914	4.48
Mitchell 2		D1	12/23/22 07:22 PM	12/23/22 09:08 PM	Opacity	90	159	915	1.77
Mitchell 2		D1	12/23/22 09:08 PM	12/24/22 02:46 AM	Opacity	150	845	916	5.63
Mitchell 2		D1	12/24/22 02:46 AM	12/24/22 04:41 AM	Opacity	90	173	917	1.92
Mitchell 2		D1	12/24/22 04:41 AM	12/24/22 02:08 PM	Opacity	75	709	918	9.45
Mitchell 2		D1	12/24/22 06:48 AM	12/24/22 07:08 AM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	415	138	911	0.33
Mitchell 2		D1	12/24/22 07:08 AM	12/24/22 12:00 PM	Reagent slurry feed tanks have frozen level indications and tanks were lower than expected	210	1,023	912	4.87
Mitchell 2		D1	12/24/22 02:08 PM	12/25/22 12:00 AM	Opacity	90	888	919	9.87
Mitchell 2		D3	12/25/22 12:00 AM	12/26/22 12:00 AM	Anticipated opacity	190	4,565	920	24.00
Mitchell 2		D3	12/26/22 12:00 AM	12/27/22 12:38 PM	Opacity	190	6,968	921	36.63
Mitchell 2		D3	12/27/22 12:38 PM	12/27/22 02:02 PM	Opacity	210	294	923	1.40
Mitchell 2		D3	12/27/22 02:02 PM	12/27/22 03:12 PM	Opacity	230	268	924	1.17
Mitchell 2		D3	12/27/22 03:12 PM	12/27/22 04:08 PM	Opacity	340	317	925	0.93
Mitchell 2		D3	12/27/22 04:08 PM	12/28/22 11:40 PM	Opacity	365	2,871	926	7.85

Event Type *
Outages

FO	Forced Outage
MO	Maintenance Outage
PO	Planned Outage
RS	Reserve Shutdown
SF	Startup Failure
Note:	i/r = inspection and repair

Curtailment

D1	Requires immediate reduction in capacity
D2	Does not require an immediate reduction in capacity but requires a reduction within six (6) hours
D3	Can be postponed beyond six (6) hours, but requires reduction in capacity before the end of the next weekend

KPSC Case No. 2023-00145
Commission Staff's First Set of Data Requests
Dated May 10, 2023
Item No. 6
Attachment 2

Unit Name	Event Type *	Event Start	Event End	Event Description
Big Sandy 1	PO	09/09/22 11:00 PM	01/14/23 11:47 AM	Boiler i/r, Generator Field Out inspection/possible rewedge, Turbine Valve i/r, Corrosion Fatigue i/r, Cooling Tower i/r, ReHeat Attemperator i/r, Gas valve i/r, FD Fan and Motor i/r, High Energy Piping (HEP) i/r, Flow Accelerated Corrosion (FAC) i/r, Core Loop testing.
Mitchell 1	PO	10/07/22 11:00 PM	11/19/22 05:32 PM	Boiler i/r, Precip i/r, Pulverizer/Feeder MATS i/r, Economizer wash, Replace Precip Transformer power cables, Replace SCR XJ s 14,15 and 115, Replace Exit Duct XJ FGX-71009, Water Cannon upgrades, Ovation Evergreen upgrade, Inter-lock testing, HE Piping i/r.
Mitchell 1	RS	11/19/22 05:32 PM	11/29/22 11:45 AM	Reserve Shutdown
Mitchell 1	SF	11/29/22 11:45 AM	11/29/22 06:03 PM	Unable to get firing permissives.
Mitchell 1	MO	12/03/22 01:47 AM	12/08/22 09:18 AM	Economizer tube leak repair
Mitchell 1	FO	12/08/22 11:45 AM	12/09/22 12:00 AM	PH Issues
Mitchell 1	FO	12/09/22 12:00 AM	12/10/22 08:01 AM	due to Urea from Hydrolyzer system entering the Condensate Return System. Samples will be collected and tested once the unit cools. Hydrolyzer will need pressurized to search for potential leaks.
Mitchell 1	FO	12/10/22 01:07 PM	12/13/22 04:30 PM	Due to Primary Superheater Outlet valve . packing blew out. Superheater Bypass Control valve URV 4, controller failed closed due to burned up controller.
Mitchell 1	RS	12/13/22 04:30 PM	12/14/22 02:45 AM	Reserve Shutdown
Mitchell 1	SF	12/14/22 02:45 AM	12/14/22 07:15 PM	Start Failure
Mitchell 1	MO	12/30/22 12:00 AM	01/22/23 05:59 PM	Boiler i/r, Boiler Hydro, Duct repairs, Clinker Removal, IK Soot Blower Repairs, 12 ID Fan Stall margin probe i/r.
Mitchell 2	PO	09/09/22 11:00 PM	12/16/22 02:25 PM	Boiler i/r, Cooling Tower i/r, Low Pressure Turbine "A"&"B" Valve replacement, SCR Catalyst #4 layer replacement, AH Basket i/r, Precip i/r.
Mitchell 2	PO	12/16/22 02:52 PM	12/16/22 03:28 PM	Boiler i/r, Cooling Tower i/r, Low Pressure Turbine "A"&"B" Valve replacement, SCR Catalyst #4 layer replacement, AH Basket i/r, Precip i/r.
Mitchell 2	FO	12/17/22 02:12 PM	12/20/22 04:08 PM	A Bus Relay PA Fan

Event Type *

FO	Forced Outage
MO	Maintenance Outage
PO	Planned Outage
RS	Reserve Shutdown
SF	Startup Failure
Note:	i/r = inspection and repair

VERIFICATION

The undersigned, Timothy C. Kerns, being duly sworn, deposes and says he is the Vice President of Generating Assets, for Appalachian Power Company and Wheeling Power Company, that he has personal knowledge of the matters set forth in the foregoing testimony and the information contained therein is true and correct to the best of his information, knowledge, and belief..

Timothy C Kerns

Timothy C. Kerns

Commonwealth of Kentucky)
) Case No. 2023-00159
County of Boyd)

Subscribed and sworn to before me, a Notary Public in and before said County and State, by Timothy C. Kerns, on December 4, 2023.

Scott E. Bishop

Notary Public

SCOTT E. BISHOP
Notary Public
Commonwealth of Kentucky
Commission Number KYNP32110
My Commission Expires Jun 24, 2025

My Commission Expires June 24, 2025

Notary ID Number KYNP 32110