

**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

In the Matter of:

AN ELECTRONIC EXAMINATION OF THE	)	
APPLICATION OF THE FUEL ADJUSTMENT	)	
CLAUSE OF KENTUCKY POWER COMPANY	)	Case No. 2023-00008
FROM NOVEMBER 1, 2020 THROUGH	)	
OCTOBER 31, 2022	)	

**DIRECT TESTIMONY OF**  
**DAVID L. MELL**  
**ON BEHALF OF KENTUCKY POWER COMPANY**

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**CASE NO. 2023-00008**

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**CASE NO. 2023-00008**

**I. INTRODUCTION**

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

2 A. My name is David L Mell, and my business address is Big Sandy Power Plant, 2300 US  
3 23, Louisa, Kentucky 41230. I am the Energy Production Superintendent at AEP-Kentucky  
4 Power Company, Big Sandy Plant.

**II. BACKGROUND**

5 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**  
6 **BACKGROUND.**

7 A. I have a Bachelor of Science in Mechanical Engineering Degree from The Ohio State  
8 University. I also have a Master of Science Degree in Engineering Management from  
9 Marshall University and am a Professional Engineer in the State of Ohio.

10 I have been employed by AEP Kentucky Power at the Big Sandy Plant for 38 years.

11 **Q. WHAT ARE YOUR PRINCIPAL AREAS OF RESPONSIBILITY WITH**  
12 **KENTUCKY POWER?**

13 A. I am responsible for the safe, reliable, and economic operation of the Big Sandy Power  
14 Plant. I am responsible for all aspects of the day-to-day operation and maintenance  
15 including outage execution and long-range planning. Currently, I lead 22 full time plant  
16 employees and associated on site contractors.

17

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED IN ANY REGULATORY**  
2 **PROCEEDINGS?**

3 A. Yes, I have previously testified before the Public Service Commission of Kentucky  
4 ("Commission") in Kentucky Power's previous two-year fuel adjustment clause hearing  
5 (Case No. 2021-00053), and sponsored discovery responses in five of the Company's last  
6 seven fuel adjustment clause cases (Case Nos. 2021-00292, 2021-00053, 2020-00245,  
7 2020-00004, and 2019-00226).

### **III. PURPOSE OF TESTIMONY**

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

9 A. My testimony describes the Planned and Maintenance Outages at the Big Sandy Plant that  
10 lasted longer than the original outage end date during the review period of November 1,  
11 2020, to October 31, 2022 ("Review Period"). Further, I will discuss the actions taken by  
12 Kentucky Power to address and remedy the factors that extended the outages, and to  
13 minimize each extension duration.

### **IV. BIG SANDY EXTENDED PLANNED AND MAINTENANCE OUTAGES**

15 **Q. PLEASE DESCRIBE KENTUCKY POWER'S PRACTICES GENERALLY WITH**  
16 **RESPECT TO OPERATING AND MAINTAINING BIG SANDY PLANT?**

17 A. The Company utilizes a robust inspection and Circular Letter Program established by  
18 American Electric Power's Corporate Engineering Group. Company Witness  
19 Rosenberger provides additional detail on the Circular Letter Program in his testimony.

20 The Company's inspection and maintenance practices allow for not only known  
21 issues to be addressed and resolved, but also for discovery of potential issues not

1 previously known. The nature of the operation of generating units brings occasional  
 2 mechanical issues and the sooner the issues are discovered the better the Company can  
 3 resolve them in a timely manner.

4 **Q. PLEASE LIST THE PLANNED OR MAINTENANCE OUTAGES THAT WERE**  
 5 **EXTENDED BEYOND THE ORIGINAL ESTIMATED END DATE DURING THE**  
 6 **REVIEW PERIOD.**

7 A. Big Sandy Plant had three Planned Outages and eight Maintenance Outages that were  
 8 extended beyond the original estimated end date during the Review Period. They are listed  
 9 in Table DLM-1 below with the original end dates and the actual end dates after the  
 10 extension.

**Table DLM-1**  
**Big Sandy Maintenance & Planned Outages Extended During Reporting Period**

Outage Number	Unit	Outage Type	Original Start Date	Original End Date	Original Outage Length (Days)	Actual Start Date	Actual End Date	Actual Outage Length (Days)
1	Big Sandy 1	Planned	9/12/2020	10/25/2020	43	9/12/2020	11/2/2020	50
2	Big Sandy 1	Planned	10/9/2021	11/21/2021	43	10/9/2021	12/22/2021	74
3	Big Sandy 1	Planned	9/10/2022	12/4/2022	85	9/10/2022	1/16/2023	128
4	Big Sandy 1	Maintenance	11/11/2020	11/16/2020	5	11/12/2020	11/16/2020	4
5	Big Sandy 1	Maintenance	1/13/2021	1/19/2021	6	1/13/2021	1/22/2021	9
6	Big Sandy 1	Maintenance	6/22/2021	6/25/2021	3	6/22/2021	6/28/2021	6
7	Big Sandy 1	Maintenance	6/30/2021	7/4/2021	4	7/1/2021	7/4/2021	4
8	Big Sandy 1	Maintenance	9/23/2021	10/1/2021	8	9/23/2021	10/8/2021	15
9	Big Sandy 1	Maintenance	3/30/2022	4/2/2022	3	3/30/2022	4/5/2022	6
10	Big Sandy 1	Maintenance	4/8/2022	4/12/2022	4	4/8/2022	4/14/2022	6
11	Big Sandy 1	Maintenance	8/15/2022	8/16/2022	1	8/15/2022	8/17/2022	2

12 **Q. WAS OUTAGE NUMBER 3 IN TABLE DLM-1 THE MOST SIGNIFICANT IN**  
 13 **TERMS OF EXTENSION PAST THE ORIGINAL END DATE?**

14 A. Yes.

1 **Q. PLEASE DESCRIBE THE ORIGINAL TIMEFRAME AND PURPOSE OF THIS**  
2 **PLANNED OUTAGE.**

3 A. Outage Number 3 was originally scheduled from September 10, 2022, until December 4,  
4 2022. The purpose of this Planned Outage was primarily the routine inspection and repair  
5 of many plant components including the boiler, turbine valves, cooling tower, and a  
6 generator inspection.

7 **Q. DID THIS PLANNED OUTAGE EXTEND BEYOND THE ORIGINAL**  
8 **ESTIMATED END DATE?**

9 A. Yes. The original scheduled end date was December 4, 2022, but was extended several  
10 times until January 16, 2023, due to emergent work that became necessary during the  
11 planned inspection and repair.

12 **Q. PLEASE DESCRIBE THE REASON FOR THE EXTENSION OF THE OUTAGE**  
13 **AND THE ACTIONS THE COMPANY TOOK TO MINIMIZE THE EXTENSION.**

14 A. Outage Number 3 was extended several times beyond the planned end date due to the  
15 following issues:

16 1) During the Planned Outage, it was discovered that the generator required a  
17 complete re-wedge and corresponding loop testing program to ensure long term  
18 reliability. The generator consists of many copper bars and coils. These  
19 components are wedged together to maintain physical integrity and eliminate  
20 the possibility of electrical hot spots, also known as overheating. Re-wedging  
21 and loop testing are the methods used to ensure continued operation. The  
22 extension resulting from the need for this work lasted from December 4, 2022,

1 to December 12, 2022. It was requested on November 7, 2022 and was  
2 approved by PJM that same day.

3 2) During reassembly on November 13, 2022, a crack was discovered on one of  
4 the two generator rotor retaining rings. Generator retaining rings secure the  
5 copper bars to the massive rotating generator field. These rings, one on each  
6 end, maintain the integrity of the rotating field which weighs 88,000 pounds  
7 and rotates at 3600 revolutions per minute. Following evaluation of crack depth  
8 and length, a replacement retaining ring was located and machined for  
9 installation. The structural integrity of either retaining ring is critical due for  
10 long term reliability and safety. If either retaining ring should fail with the unit  
11 in service, the rotating field bars will be ejected into the stator and destroy the  
12 generator. This violent mechanical failure would not be contained within the  
13 generator housing which would release hydrogen gas along with molten debris  
14 into the turbine building, and was required to be addressed. This extension  
15 lasted from December 12, 2022, to December 30, 2022, and was requested by  
16 the Company and approved by PJM on December 2, 2022.

17 3) During generator reassembly on December 18, 2022, the hydrogen seal housing  
18 on the exciter end was leaking hydrogen at a level beyond the manufacturer's  
19 (Westinghouse) acceptable level. This issue required hydrogen seal removal  
20 and machining to repair. The Westinghouse acceptable level (hydrogen loss  
21 rate) is 20 cubic feet of leakage per 24 hours. During acceptance testing, the  
22 equivalent hydrogen as-measured leakage was over 800 cubic feet per 24 hours.  
23 Leak rate testing is performed with compressed air and converted by formula

1 to a hydrogen equivalent. At this leakage rate there would not be enough  
2 capacity in the hydrogen makeup system to sustain operation. In addition, at  
3 this hydrogen leakage rate, hydrogen could leak into the turbine building setting  
4 up a potential explosive atmosphere. The issue therefore was required to be  
5 addressed. This extension, from December 30, 2022, to January 5, 2023, was  
6 requested on December 22, 2022, and approved by PJM on December 28, 2022.

- 7 4) During unit startup, the unit was removed from service due to water chemistry  
8 exceeding quality limitations. Exceeding water chemistry limitations would  
9 result in failures of boiler, turbine, and condensate/feedwater components. As  
10 suspected, a corresponding condenser leak was located on January 10, 2023.  
11 This extension, and the final extension listed in item number 5 below were  
12 requested by Kentucky Power and approved by PJM as inspection/repairs to the  
13 condensers were part of the original Planned Outage work scope. This PJM  
14 guideline anticipates short term potential extensions associated with work to  
15 improve long term reliability.
- 16 5) Following repair of the main condenser leak the Planned Outage was extended  
17 from January 14, 2023, to January 16, 2023, to return boiler water chemistry to  
18 acceptable levels. This final extension, from January 14, 2023, to January 16,  
19 2023, was requested on January 12, 2023, and approved by PJM on January 14,  
20 2023.

21 During each of the delays, manpower schedules were modified to include weekends  
22 and nights where applicable. AEP Engineering and machine shop services were also  
23 utilized.



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**Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 1 IN TABLE DLM-1 ABOVE WAS EXTENDED AND THE ACTIONS THE COMPANY TOOK TO MINIMIZE THE EXTENSION.**

**A.** Outage Number 1 was a Planned Outage for boiler inspection and repair, including high energy piping inspections and replacement of several hydraulic hoses associated with the main turbine steam admission valves. The hydraulic hose replacement was prescribed per the Circular Letter Program. After replacement of several hoses, debris was detected during testing, which required flushing, cleaning, and repeated operation of the main turbine steam admission valves.

This Planned Outage was extended seven days due to the erratic operation of main turbine steam admission valves found during post maintenance testing. This reliability work was supported by extended shifts including weekends. In addition, the replacement hose vendor was utilized to minimize this extension.

**Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 2 IN TABLE DLM-1 ABOVE WAS EXTENDED AND THE ACTIONS THE COMPANY TOOK TO MINIMIZE THE EXTENSION.**

**A.** Outage Number 2 was a Planned Outage for boiler inspection and repair, including high energy piping inspections. A portion of these inspections, per the Circular Letter Program, was to inspect the reheat steam piping. Reheat steam piping is comprised of a high temperature alloy which operates at a temperature of 1,050 degrees Fahrenheit. This Planned Outage was extended thirty-one days due to the fact that during the reheat steam piping inspection a six-foot length of piping was found to be at end of life. AEP

1 internal engineering performed this evaluation and developed the plan for replacement.  
2 The material for this repair is not readily available. In addition, the replacement piping  
3 had to be bent to fit in a special pipe shop and stress relieved following installation.  
4 Finally, to safely execute this in-line replacement, extensive planning, temporary  
5 supports, and detailed procedures were required.

6 Big Sandy Plant, AEPSC Engineering, and several vendors and contractors  
7 worked extended hours to safely resolve this issue.

8 **Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 4 IN TABLE DLM-1**  
9 **ABOVE WAS EXTENDED.**

10 A. Outage Number 4 was a Maintenance Outage primarily scheduled to protect Big Sandy  
11 Unit 1 from any impact damage associated with the demolition of a portion of Big Sandy  
12 Unit 2.

13 This Maintenance Outage schedule was modified. The start date was delayed by  
14 one day as the demolition team was not ready to begin at the original start time. The end  
15 time extended by four hours to allow completion of the work on the north hydrogen  
16 cooling water pump.

17 **Q PLEASE DESCRIBE THE REASON OUTAGE NUMBER 5 IN TABLE DLM-1**  
18 **ABOVE WAS EXTENDED AND THE ACTIONS TAKEN BY THE COMPANY TO**  
19 **MINIMIZE THE EXTENSION.**

20 A. Outage Number 5 was a Maintenance Outage for boiler inspection and repair, including  
21 the inspection of the auxiliary boiler feed pump. The auxiliary boiler feed pump required  
22 during each unit startup and shutdown was intermittently pumping. This intermittent  
23 issue put the unit at risk for a forced outage to repair the problem.

1           This Maintenance Outage was extended by three days because the debris found in  
2 the auxiliary boiler feed pump inlet valve required three additional days to remove and  
3 return this pump to service. Part of this extension was inspecting the deaerator storage  
4 tank for additional debris. The duration of this extension was minimized by focused  
5 planning and appropriately assigning resources.

6 **Q     PLEASE DESCRIBE THE REASON OUTAGE NUMBER 6 IN TABLE DLM-1**  
7 **ABOVE WAS EXTENDED AND THE ACTIONS TAKEN BY THE COMPANY TO**  
8 **MINIMIZE THE EXTENSION.**

9 A.     Outage Number 6 was a Maintenance Outage for boiler inspection and repair. During this  
10 outage a boiler leak was detected. The leak was found during the slow cool down period  
11 and is the reason Big Sandy regularly schedules three-day maintenance outages following  
12 the unit being removed from reserve shutdown.

13           This Maintenance Outage was extended three days to repair two tubes on the  
14 boiler rear wall. These repairs included a partial boiler scaffold to access the leak location  
15 inside the main furnace. The duration of this extension was minimized by focused  
16 planning and appropriately assigning resources.

17 **Q     PLEASE DESCRIBE THE REASON OUTAGE NUMBER 7 IN TABLE DLM-1**  
18 **ABOVE WAS EXTENDED.**

19 A.     Outage Number 7 was a Maintenance Outage for boiler inspection and repair. This  
20 Maintenance Outage was extended for five hours for administrative purposes. This short  
21 extension was added to properly align the unit parallel time with PJM system scheduling.

1 **Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 8 IN TABLE DLM-1**  
2 **ABOVE WAS EXTENDED AND THE ACTIONS TAKEN BY THE COMPANY TO**  
3 **MINIMIZE THE EXTENSION.**

4 A. Outage Number 8 was a Maintenance Outage for boiler inspection and repair which  
5 included investigating a steam leak on reheat turbine low point startup drain piping.  
6 Utilizing Maintenance Outage Number 8 uncovered a significant piping failure and safety  
7 issue that was subsequently repaired during Planned Outage Number 2.

8 This Maintenance Outage was extended by seven days due to the non-destructive  
9 examination of the reheat steam piping at a small steam leak repair location. These  
10 additional steps were done at the request of AEP Engineering to fully evaluate pipe  
11 condition as related to safety integrity. This Maintenance Outage duration extended  
12 seamlessly into Planned Outage Number 2. The duration of this extension was  
13 minimized by focused planning and appropriately assigning resources.

14 **Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 9 IN TABLE DLM-1**  
15 **ABOVE WAS EXTENDED AND ACTIONS TAKEN BY THE COMPANY TO**  
16 **MINIMIZE THE EXTENSION.**

17 A. Outage Number 9 was a Maintenance Outage for boiler inspection and repair. During the  
18 boiler cool-down the steam drum doors were found to be slightly leaking steam and hot  
19 water. Rather than taking the risk of the subsequent startup being delayed, both steam  
20 drum doors were sealed.

21 This Maintenance Outage was extended by three days to reseal the steam drum  
22 doors. The steam drum doors seal against an operating pressure of 2,600 psi. Sealing the  
23 doors takes very little time. Cooling the drum to eliminate the internal steam pressure

1 was the main reason for the extension. The duration of this extension was minimized by  
2 focused planning and appropriately assigning resources.

3 **Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 10 IN TABLE DLM-1**  
4 **ABOVE WAS EXTENDED AND ACTIONS TAKEN BY THE COMPANY TO**  
5 **MINIMIZE THE EXTENSION.**

6 A. Outage Number 10 was a Maintenance Outage that followed a forced outage for a main  
7 condenser leak. During a large condenser leak the boiler and condensate water were  
8 contaminated. Once the condenser leak was repaired the corresponding maintenance  
9 outage was required to flush plant components and build water inventory.

10 This Maintenance Outage was extended two days to build condensate inventory  
11 for startup. The duration of this extension was minimized by focused planning and  
12 appropriately assigning resources.

13 **Q. PLEASE DESCRIBE THE REASON OUTAGE NUMBER 11 IN TABLE DLM-1**  
14 **ABOVE WAS EXTENDED AND THE ACTIONS TAKEN BY THE COMPANY TO**  
15 **MINIMIZE THE EXTENSION.**

16 A. Outage Number 11 was a Maintenance Outage for boiler inspection and repair including  
17 repair to the steam seal regulator. The steam seal regulator provided steam to seal the  
18 turbines. Without proper steam seals with unit cannot be restarted. Although all the  
19 necessary parts were on site, making the repairs took one day longer than expected.

20 This Maintenance Outage was extended one day. The duration of this extension  
21 was minimized by focused planning and appropriately assigning resources.

22

**V. CONCLUSION**

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

2 **A. Yes, it does.**



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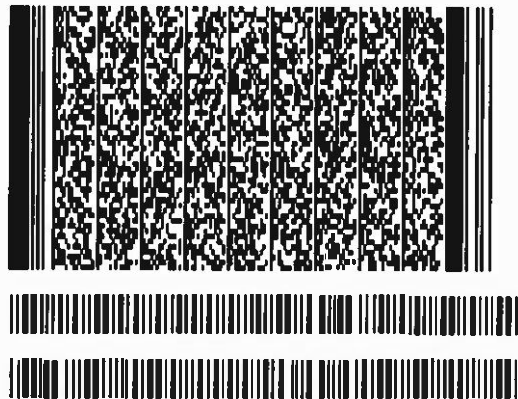
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#### E-Signature Summary

**E-Signature 1: David L Mell (DLM)**  
 October 03, 2023 10:07:21 -8:00 [D058510638A8] [167.239.221.105]  
 dlmell@aep.com (Principal) (Personally Known)

**E-Signature Notary: Marilyn Michelle Caldwell (MMC)**  
 October 03, 2023 10:07:21 -8:00 [33459EE693C3] [167.239.221.107]  
 mmcaldwell@aep.com  
 I, Marilyn Michelle Caldwell, did witness the participants named above electronically sign this document.



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**VERIFICATION**

The undersigned, David L. Mell, being duly sworn, deposes and says he is the Energy Production Superintendent - Big Sandy Plant for Kentucky 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 after reasonable inquiry.

David L. Mell  
Signed on 2023-10-03 16:57:21 -0500

David L. Mell

Commonwealth of Kentucky )

County of Boyd )

Case No. 2023-00008

Notarial act performed by audio-visual communication

Subscribed and sworn to before me, a Notary Public in and before said County and State, by David L. Mell, on October 3, 2023.

Notary Public

Marilyn Michelle Caldwell  
Signed on 2023-10-03 16:57:21 -0500

**MARILYN MICHELLE CALDWELL**  
ONLINE NOTARY PUBLIC  
STATE AT LARGE KENTUCKY  
Commission # KYNP71841  
My Commission Expires May 05, 2027  
Notary Stamp: 2023-10-03 16:57:21 PST

My Commission Expires May 5, 2027

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